Installation and Connections

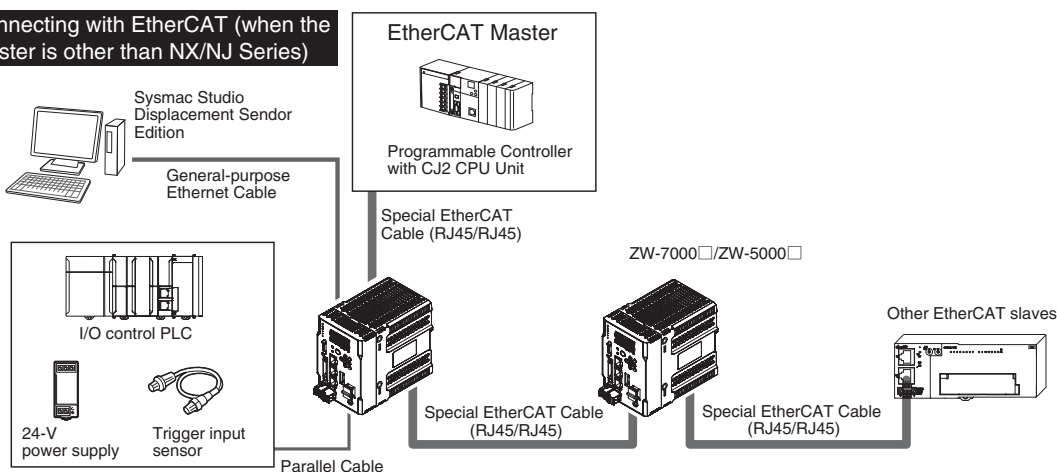# 2-1 System Configuration

System Configuration

Connecting with EtherCAT (when the master is NX/NJ Series)

EtherCAT Master

NX/NJ-series Machine Automation Controller

Sysmac Studio Standard Edition

General-purpose USB Cable
General-purpose Ethernet Cable

I/O control PLC

24-V power supply

Trigger input sensor

Special EtherCAT Cable (RJ45/RJ45)

ZW-7000□/ZW-5000□

Other EtherCAT slaves

Parallel Cable

Special EtherCAT Cable (RJ45/RJ45)

Special EtherCAT Cable (RJ45/RJ45)
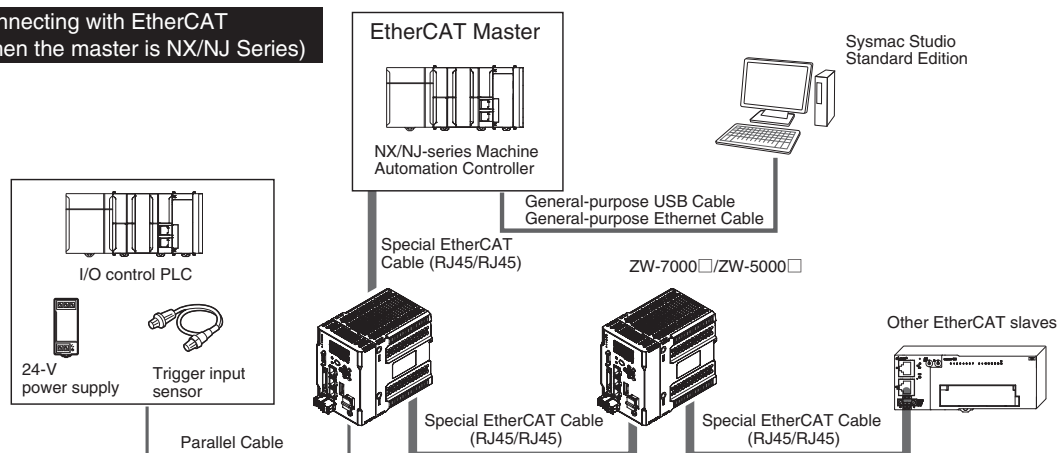
Connecting with EtherCAT (when the master is other than NX/NJ Series)

EtherCAT Master

Programmable Controller with CJ2 CPU Unit

Sysmac Studio Displacement Sendor Edition

General-purpose Ethernet Cable

Special EtherCAT Cable (RJ45/RJ45)

ZW-7000□/ZW-5000□

I/O control PLC

24-V power supply

Trigger input sensor

Parallel Cable

Other EtherCAT slaves

Special EtherCAT Cable (RJ45/RJ45)

Special EtherCAT Cable (RJ45/RJ45)

EtherNet/IP and No-protocol Ethernet Connections

Control PLC, RC, or MC

Programmable Controller with CJ2 CPU Unit

NX/NJ-series Machine Automation Controller

Sysmac Studio Displacement Sendor Edition

General-purpose Ethernet Cable

General-purpose Ethernet Cable

Industrial EtherNet/IP/ Ethernet Switching Hub

General-purpose Ethernet Cable

ZW-7000□/ZW-5000□

General-purpose Ethernet Cable

Parallel Cable

24-V power supply

Trigger input sensor

I/O control PLC

Connection Compatibility

Connected to ZW-7000☐ ZW-5000☐	Other connection				
	EtherCAT	EtherNet/IP	Ethernet (no-protocol)	RS-232C (no-protocol)	I/O Cable
EtherCAT	---	Not compatible	Compatible	Compatible	Compatible
EtherNet/IP	Not compatible	---	Compatible	Compatible	Compatible
Ethernet (no-protocol)	Compatible	Compatible	---	Compatible	Compatible
Ethernet (programmable no-protocol)	Compatible	Compatible	Compatible	---	Compatible

Important

- EtherCAT and EtherNet/IP connections cannot be used at the same time.
- Can be connected simultaneously via Ethernet with PC tools (Sysmac Studio, SmartMonitorZW) and another device (PLC etc). Can be connected simultaneously via Ethernet with PC tools (Sysmac Studio, SmartMonitorZW) and another device (PLC etc). The port number for the PC tool is 9600 (fixed) and 9602 (fixed). When connecting different devices, set the port number to other than 9600 and 9602 (default value is 9601).

| Product	Model	Application
ZW	ZW-7000☐/5000☐	This Displacement Sensor performs measurements.
PC Tool	Sysmac Studio Standard Edition • SYSMAC-SE200D (no licenses included (media only)) • SYSMAC-SE201L (1-license edition) • SYSMAC-SE2☐☐L (multilicense editions (3, 10, 30, or 50 licenses)) Sysmac Studio Measurement Sensor Edition • SYSMAC-NE00☐L (1 or 3 licences)	This is the setup application. It is part of the Sysmac Studio Package and it runs on Windows. The Sysmac Studio comes in two different editions. • Sysmac Studio Standard Edition The Sysmac Studio provides an integrated development environment for the NX/NJ series Controllers and other Machine Automation Controllers and EtherCAT Slaves. It supports setup, programming, debugging, operation, and maintenance. The Sysmac Studio Standard Edition DVD includes Support Software for EtherNet/IP, DeviceNet, serial communications, and PT screen design (CX-Designer). Refer to the Sysmac catalog (Cat. No. P072) for details. • Sysmac Studio Measurement Sensor Edition This license provides the functions that are required to set up ZW-7000/5000 Series Vision Sensors from the Sysmac Studio. This model number is for the license only. You must also purchase the DVD for the Sysmac Studio Standard Edition Ver.1.15 or higher.
Special EtherCAT Cable	Refer to 10-1 Specifications and Dimensions	The Special EtherCAT Cable connects the Sensor to another Sensor or to another EtherCAT device.
General-purpose Ethernet cable	---	Prepare commercially available Ethernet cable satisfying the following requirements: • Category 5e or more, 30 m or less • RJ45 connector (8-pin modular jack) • For direct connection: Select cross cable. • For connection through an industrial switching hub: Select straight cable.
Special I/O Cable	For connecting to a PLC or programmable terminal • ZW-XPT2 For connecting to a PC • ZW-XRS2	Connect the sensor with a PLC, programmable terminal, or personal computer etc..
Industrial EtherNet/IP / Ethernet Switching Hub	• W4S1-03B (3 ports type) • W4S1-05B • W4S1-05C (5 ports type)	The Switching Hub connects multiple Sensors to one Touch Finder or one computer running PC Tool.

2 Installation and Connections

Product	Model	Application

EtherCAT Junction Slave	• GX-JC03
	  (3 ports type)
	• GX-JC06
	  (6 ports type)
		Used to connect multiple sensors or PLCs using EtherCAT.

2-2 Part Names and Functions
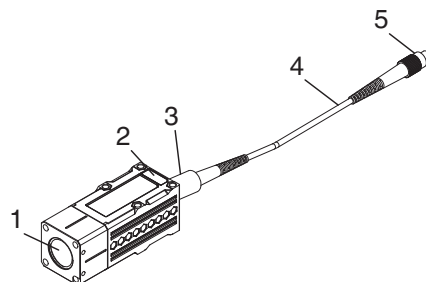
The following describes the names and functions of parts of the Sensor Head, Calibration ROM and Sensor Controller.
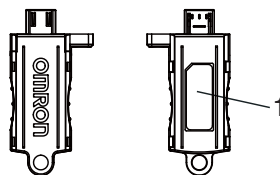
Sensor Head
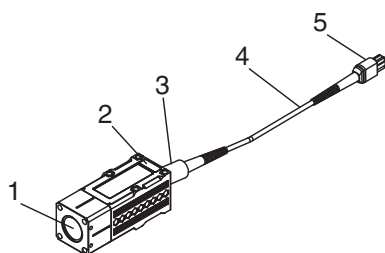
● ZW-S70□0   ● ZW-S50□0

No.	Names	Functions
1	Projector/receiver	Projects and receives light.
2	Serial number.	Serial number. Only a calibration ROM with the same serial number is available.
3	Fiber interface	Interfaces the Sensor Head and optical fiber. (Do not remove this fiber interface. If you remove it, repair may be needed.)
4	Fiber Cable	Sends or receives light signals to/from the Sensor Controller.
5	Fiber Connector	Couples the Sensor Controller and fiber cable.

Calibration ROM

This ROM is associated with the sensor on a one-to-one basis, and operates connected to the Sensor Controller.

No.	Names	Functions
1	Serial number	Serial number. Only a Sensor Head with the same serial number is available.

Important

Use with the Calibration ROM always connected. If the Calibration ROM is not connected, the error message "SYSERR" is shown in the main digital and "NO.ROM" is shown in the sub digital, where measurement is not possible.
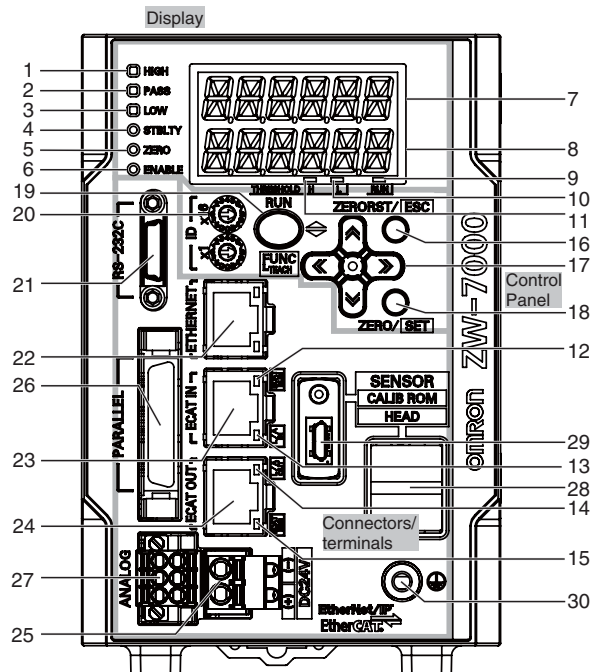
If the Calibration ROM is lost, or fails, refer to p.176.

"6-1 Error Messages" described in Displacement Sensor ZW-7000/5000 series Confocal Fiber Type Displacement Sensor User's Manual for Communications Settings (Z363)
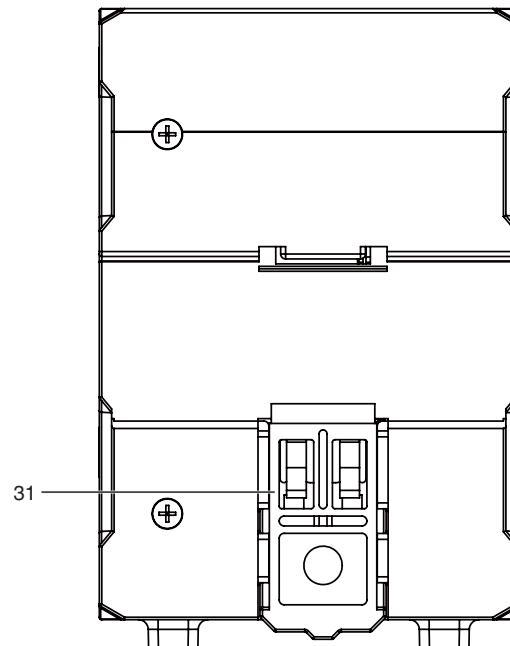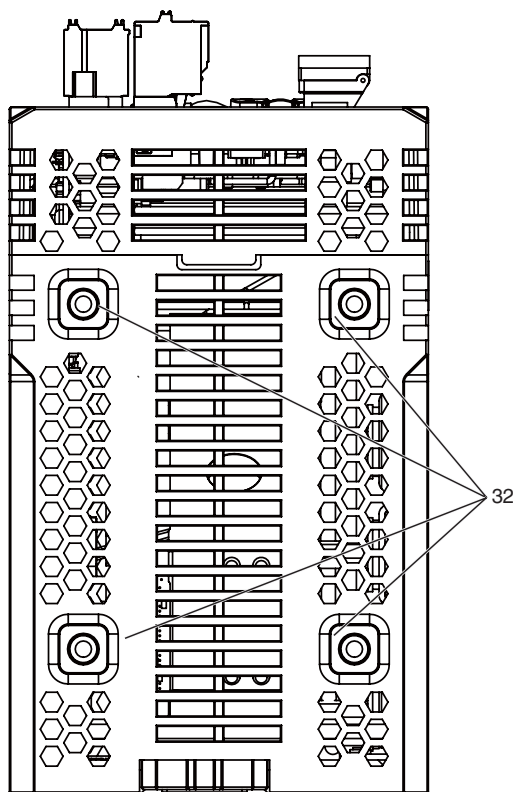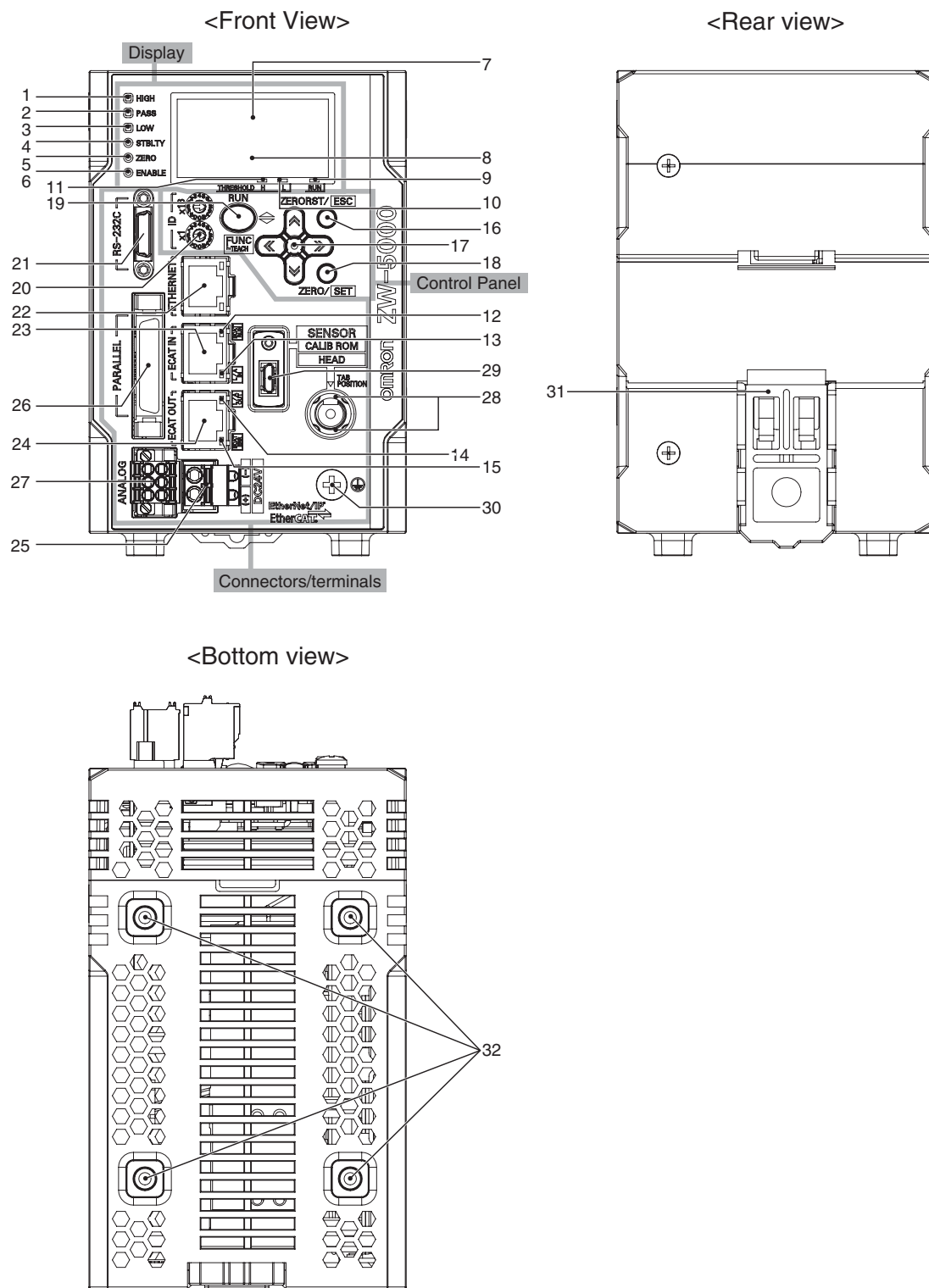
Sensor Controller

ZW-7000

<Front view>

Display

1 HIGH
2 PASS
3 LOW
4 STBLTY
5 ZERO
6 ENABLE

7
8
9
10

19
20
21

RUN
ID
FUNC TEACH

ZERORST / ESC
16
17

Control Panel
18

ZERO / SET
12

11

ETHERNET
22
26
23
24
27
25

PARALLEL
ECAT IN
ECAT OUT
ANALOG
DC24V

SENSOR
CALIB ROM
HEAD

29
13
28
14

Connectors/ terminals
15

EtherNet/IP
EtherCAT
30

<Rear view>

31

<Bottom view>

32

<Front View>

Display

1 HIGH
2 PASS
3 LOW
4 STBLTY
5 ZERO
6 ENABLE

7

8

9

THRESHOLD H L RUN

11
19

10

16

17

18

Control Panel

12

13

29

28

14

15

30

21

20

22

23

26

24

27

25

Connectors/terminals

<Rear view>

31

2 Installation and Connections

<Bottom view>

32

Front view

● Display

No.	Names (light color)	Functions
1	HIGH indicator (orange)	The HIGH indicator is lit while judgment is resulted in HIGH (HIGH threshold value < measured value).
2	PASS indicator (green)	The PASS indicator is lit while judgment is resulted in PASS (LOW threshold value ≤ measured value ≤ HIGH threshold value).
3	LOW indicator (orange)	The LOW indicator is lit while judgment is resulted in LOW (measured value < LOW threshold value).
4	STABILITY indicator (green)	The STABILITY indicator is lit while the measurement area 1 is within the measuring range. It goes out if a measured value is out of the measuring range.
5	ZERO indicator (green)	The Zero Reset indicator is lit while the zero reset function is enabled.
6	ENABLE indicator (green)	The ENABLE indicator lights when the Sensor is ready for measurement. It goes off when measurement is not possible (e.g. when the received light amount is excessive or insufficient, when the calibration ROM is not connected, or when measurement is not being performed in FUNC mode).
7	Main display (white)	The main display shows measured values and/or function names.
8	Sub-display (green)	The sub-display shows additional information for measured values or setting values for functions.
9	RUN indicator (green)	The RUN indicator is lit in the RUN mode, and goes out in the FUNC mode.
10	THRESHOLD-L indicator (orange)	The LOW threshold value indicator is lit when the Sub-display indicates a LOW threshold value.
11	THRESHOLD-H indicator (orange)	The HIGH threshold value indicator is lit when the Sub-display indicates a HIGH threshold value.
12	ECAT RUN indicator (green)	ECAT RUN indicator lights up when EtherCAT communication is established.
13	L/A IN indicator (green)	L/A IN indicator lights up when connected with the EtherCAT device. Flashes when communication (data input) is performed.
14	L/A OUT indicator (green)	L/A OUT indicator lights up when connected with the EtherCAT device. Flashes when communication (data output) is performed.
15	ECAT ERROR indicator (red)	ECAT ERROR indicator lights up when an EtherCAT communication error occurs.

● Control panel

No.	Names	Functions
16	ZERORST/ESC key	These keys function differently depending on operation modes.
17	← (LEFT) key → (RIGHT) key ↑ (UP) key ↓ (DOWN) key	📖 7-2 Functions of Operating Keys p.200
18	ZERO/SET key	
19	Mode switching key	
20	Node address setting switches (hexadecimal representation)	These switches are used to set the node address as an EtherCAT communications device. The setting range is 0x01(1) to 0xFF(255).

● **Connectors/terminals**

No.	Names	Functions
21	RS-232C connector	Connect the RS-232C cable when you are connecting the system with a PLC or personal computer through RS-232C. For the RS-232C cable, please use the following exclusive products: If you use a cable not included in the exclusive products, a false operation or breakdown may result. • For connecting to a PLC or programmable terminal: ZW-XPT2 • For connecting to a PC: ZW-XRS2
22	Ethernet connector	This connector is used to connect with a personal computer through Ethernet. For Ethernet cable, use a commercially available cable which satisfies the following conditions: • Category: 5e, or higher and Length: 30m or shorter. • RJ45 connector (8 pin registered jack) • When connect 1:1: select Ethernet crossover cable. • When connect by network HUB: select straight cable.
23	EtherCAT input connector	This connector is used to connect to EtherCAT-compatible devices. Use the recommended EtherCAT cable.
24	EtherCAT input output connector	This connector is used to connect to EtherCAT-compatible devices. Use the recommended EtherCAT cable.
25	24 V input terminal block	This connector is used to connect to Sensor Controller DC24 V power supply. The length of Cables should be less than 30 m.
26	32-pole extension connector	• This connector connects the following output and input signals: • Output signal: Parallel I/Os, including output for judgment, ALARM, BUSY ENABLE, Bank Number, SYNCFLG/TRIGBUSY, STABILITY, LOGSTAT, LOGERR, TASKSTAT • Input signal: ZERO, RESET, TIMING, LIGHT OFF, LOGGING, Bank Number, SYNC/TRIG • Make sure to use the electric cable within 2m.
27	Analog output terminal block	This connector connects the output for analog voltage and analog current. Use the electric cable within 2m.
28	Fiber adapter	The fiber adapter connects the fiber connector.
29	ROM connector	The ROM connector connects the calibration ROM.
30	Frame ground terminal	This is the connector for frame ground. It connects grounding wire.

Rear view

No.	Names	Functions
31	DIN track attachment hook	Used when fixing the Sensor Controller on DIN track.

## Bottom view

No.	Names	Functions
32	Installation screw hole	Used when fixing the Sensor Controller with screws.

Detailed LED specifications are given below.

LED name	Color	Status	Contents
ECAT RUN indicator	Green	OFF	Initialization status
		Blinking	Pre-Operational status
		Single flash	Safe-Operational status
		ON	Operational status
ECAT ERROR indicator	Red	OFF	No error
		Blinking	Communication setting error or PDO mapping error
		Single flash	Synchronization error or communications data error
		Double flash	Application WDT timeout
		ON	PDI WDT timeout
L/A IN indicator	Green	OFF	Link not established in physical layer
		Flickering	In operation after establishing link
		ON	Link established in physical layer
L/A OUT indicator	Green	OFF	Link not established in physical layer
		Flickering	In operation after establishing link
		ON	Link established in physical layer

Note

The timing of the flashing of the EtherCAT operation indicators is as follows:
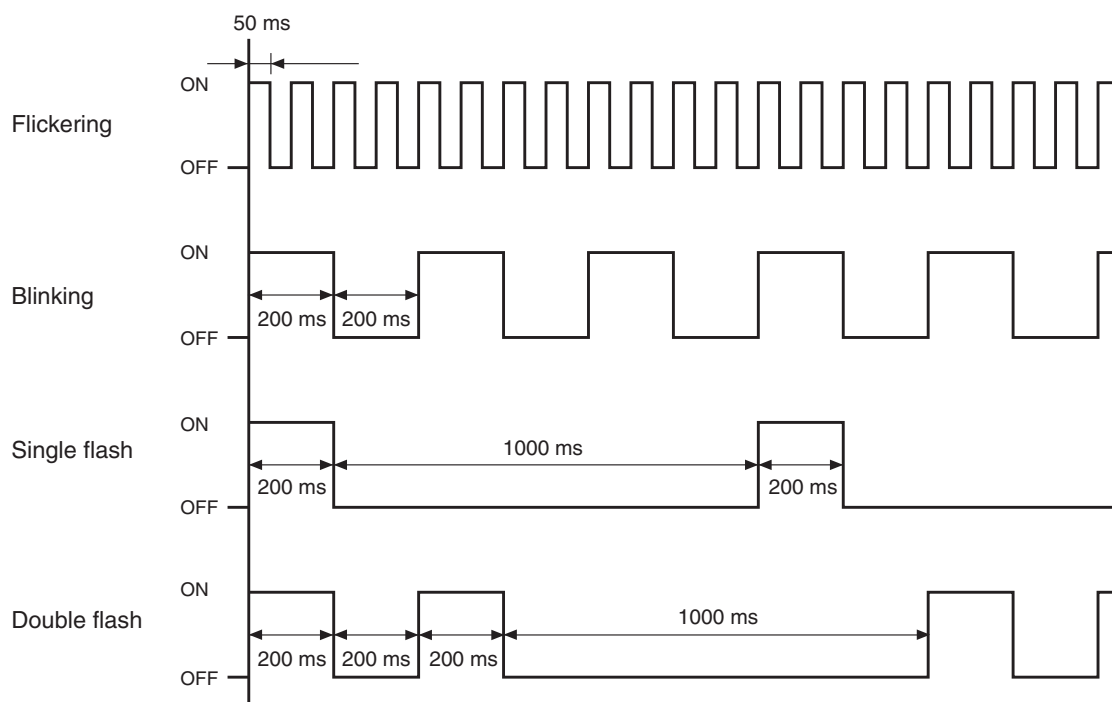
2-3 Installation

Installation of Sensor Head

Installation procedure

1 **Place the Sensor Head with an appropriate distance from the target to measure, fixing it by tightening four M3 screw inserted into their respective installation holes.**
Tightening torque: 0.54 N • m

📖 9-1 Specifications and External Dimensions p.264

M3 screw×4
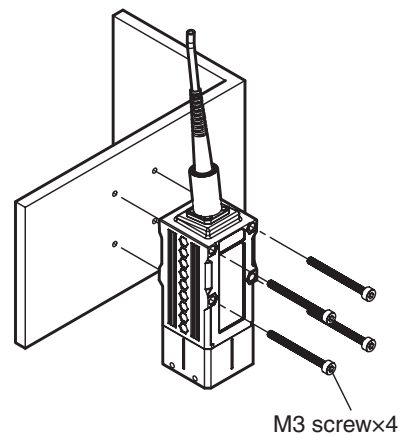
Important

• For the location screw holes, see the external dimensions.
• Adjust settings while visually checking the position and brightness of a spot on an object with diffuse reflection.
   When measuring on a high-reflectivity object, such as a mirror or wafer, visual check may be difficult.
   Additionally, the measurement value which set out of the measurement region may be output.

Basic precautions for installation

Do not install the Sensor Head in a place where strong light hits the laser emitter/receiver section of the Sensor Head. Also, if an object has a shiny surface, the light from the lighting will be reflected and a malfunction may occur. In such a case, prevent reflection by, for example, covering the light to stop reflection.
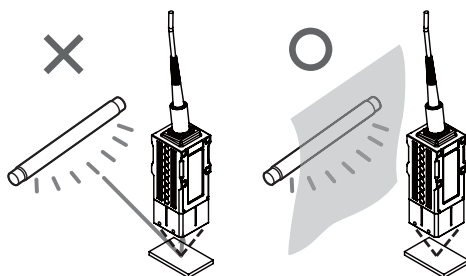
Measuring range

With the ZW-7000/5000 series, the measurement center distance is expressed as 0 with the NEAR side as + and the FAR side as -.

● ZW-S7010/ZW-S5010

Measurement center distance: 10 mm

NEAR side: +0.5 mm
Measuring center: 0 mm

Measuring range

FAR side: -0.5 mm[1]

● ZW-S7020/ZW-S5020

Measurement center distance: 20 mm

NEAR side: +1 mm
Measuring center: 0 mm

Measuring range

FAR side: -1 mm

● ZW-S7030/ZW-S5030

Measurement center distance: 30 mm

NEAR side: +2 mm
Measuring center: 0 mm

Measuring range

FAR side: -2 mm
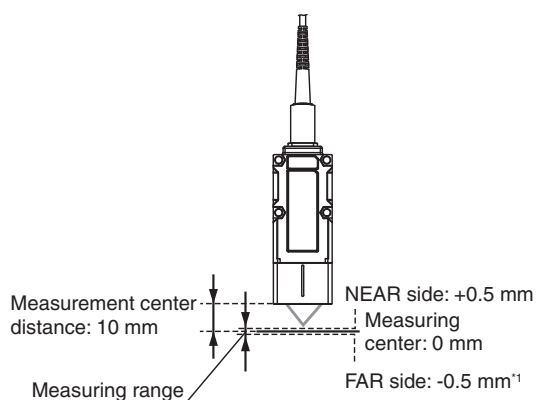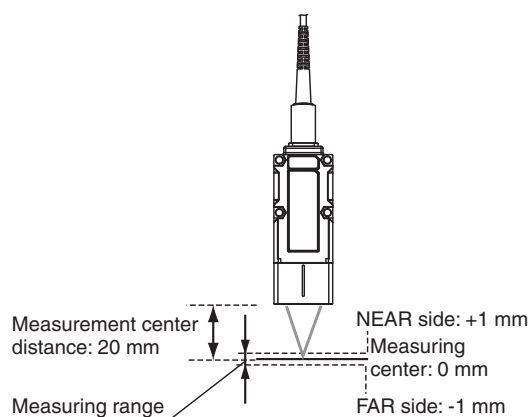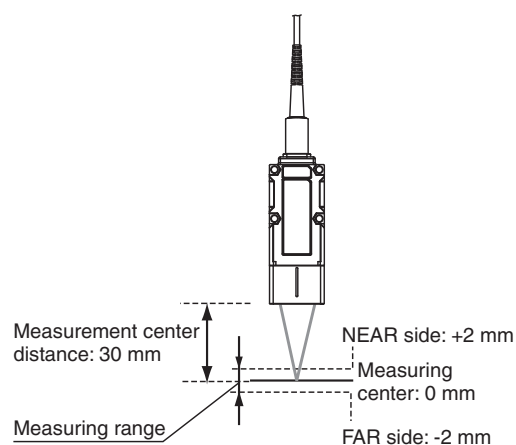
With the ZW-7000, the measurement area differs depending on the measurement cycle.
The measurement area for each measurement cycle is as follows.

Sensor Head Model	ZW-S7010		ZW-S7020		ZW-S7030	
Measurement cycle	Near	Far	Near	Far	Near	Far
28µs or more	+0.5mm	-0.5mm	+1mm	-1mm	+2mm	-2mm
27µs	+0.5mm	-0.47mm	+1mm	-0.95mm	+2mm	-1.9mm
26µs	+0.5mm	-0.43mm	+1mm	-0.9mm	+2mm	-1.8mm
25µs	+0.5mm	-0.4mm	+1mm	-0.85mm	+2mm	-1.7mm
24µs	+0.5mm	-0.34mm	+1mm	-0.73mm	+2mm	-1.46mm
23µs	+0.5mm	-0.28mm	+1mm	-0.61mm	+2mm	-1.22mm
22µs	+0.5mm	-0.22mm	+1mm	-0.49mm	+2mm	-0.98mm
21µs	+0.5mm	-0.16mm	+1mm	-0.37mm	+2mm	-0.74mm
20µs	+0.5mm	-0.1mm	+1mm	-0.25mm	+2mm	-0.5mm

Mutual interference

When using two or more Sensor Heads in opposition to each other, mutual interference will not occur if other beam spots are outside the ■ areas in the following diagrams.

● ZW-S7010/ZW-S5010

9.5 mm
1 mm
1.2 mm
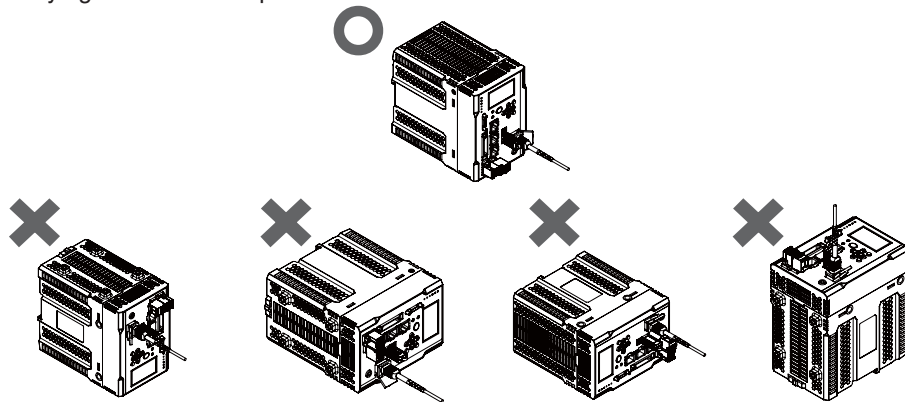
● ZW-S7020/ZW-S5020

19 mm
2 mm
1.7 mm

● ZW-S7030/ZW-S5030

28 mm
4 mm
2.4 mm
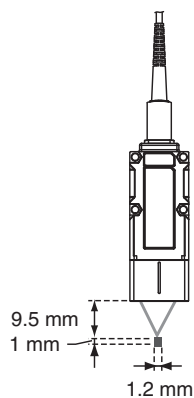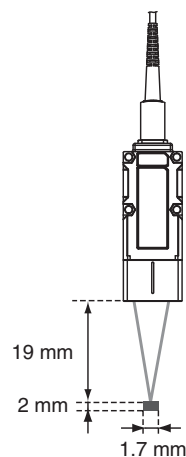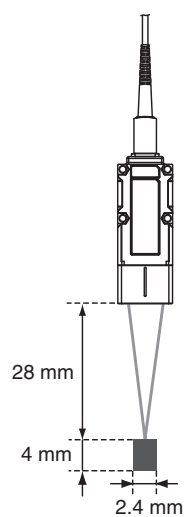
Installation of Sensor Controller

Precautions for installation

Install the Sensor Controller in the orientation indicated by the circle mark in the following figure. Do not install it laying on its side or upside down.

For adequate intake and/or exhaust, keep the Sensor Controller clear by 30 mm or more on its top, and by 10 mm or more from either side.
To secure the Sensor Head and cables connected safely, keep the front of the Sensor Controller clear by 65 mm or more.
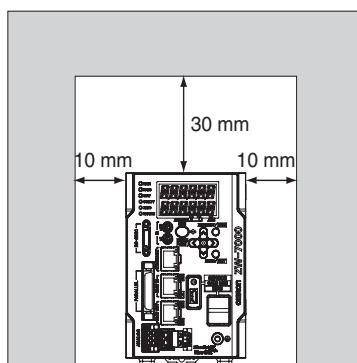
If more than one Sensor Controller must be placed in parallel, place them 10 mm or more apart each other, keep them clear by 30 mm or more on their top and 30 mm or more under them.
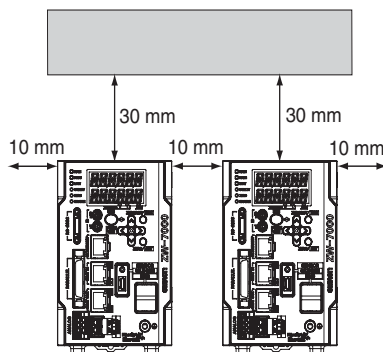
Important

Do everything possible to avoid installation in a location with vibration.

Installing on the DIN track

The following describes how to attach the Sensor Controller on a 35 mm-wide DIN track.

DIN track (option)
PFP-100N (1 m)
PFP-50N (0.5 m)
PFP-100N2 (1 m)

End plate (option)
PFP-M
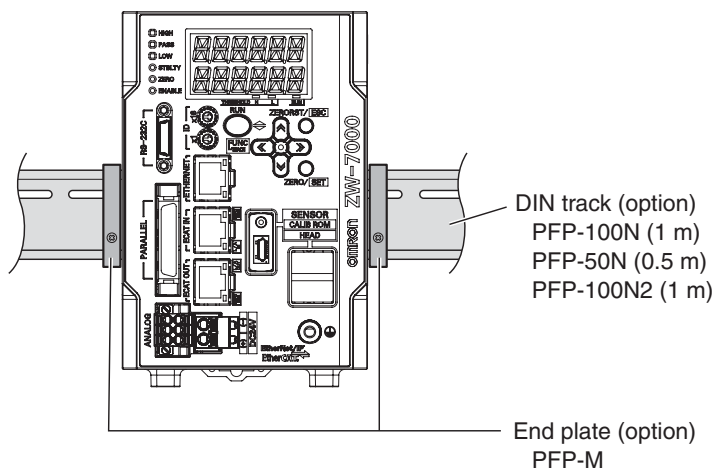
Installation procedure

1 **Hook the upper edge of the Sensor Controller's back slot onto the upper edge of the DIN track.**

2 **Push the Sensor Controller down onto the DIN track until the DIN track attachment hook is locked.**
Push in until you hear a "click" sound.

DIN track attachment hook
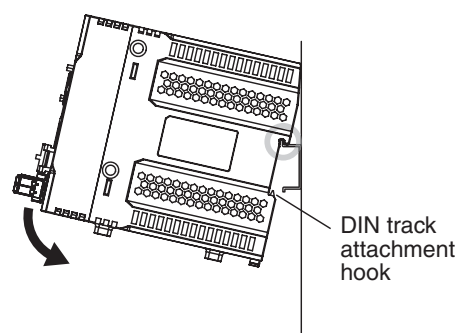
> **Important**
>
> Always hook the upper edge of the slot on the Sensor Controller's back first onto the DIN track. Hooking the Sensor Controller starting from the lower edge of the slot may impair the mounting strength. After completely installing the Sensor Controller, make sure that it is securely fixed.

Removal procedure

1 **Pull DIN track attachment hook downwards using a slotted screwdriver or an equivalent.**

2 **Lift up the Sensor Controller from the lower side, and remove it from the DIN track.**

DIN track attachment hook
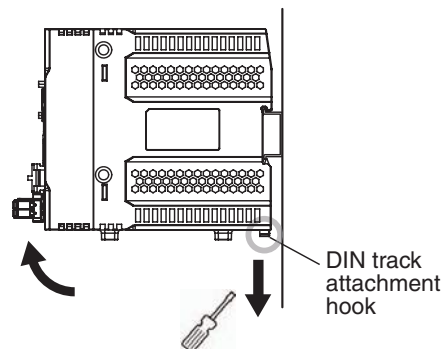
Installing on bottom

The following describes how to attach the Sensor Controller on its bottom.
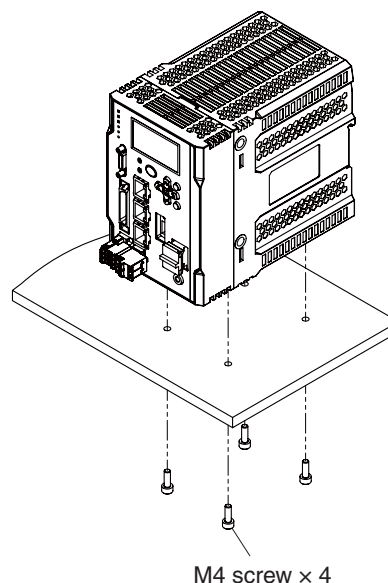
1 **Drill four installation holes on the base.**

> **Important**
>
> For the location installation holes, see the external dimensions.
>
> 📖 9-1 Specifications and External Dimensions p.264

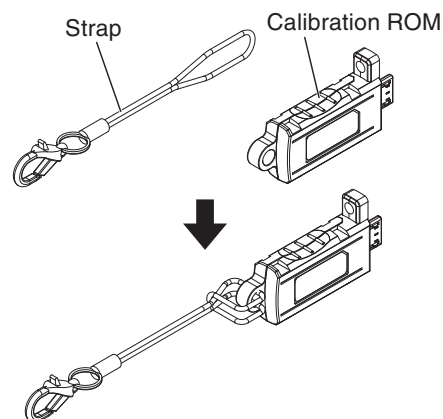**2** **Tighten four M4 screws to fix the Sensor Controller on the base.**
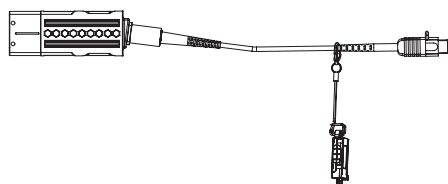Tightening torque: 1.2 N • m
Sensor Controller thread depth: 6 mm

M4 screw × 4

Attaching the strap to the Calibration ROM

1 **Attach the supplied strap to the calibration ROM.**

Strap   Calibration ROM

2 **Attach the calibration ROM to the Sensor Head.**

● **ZW-7000 Series**   ● **ZW-5000 Series**
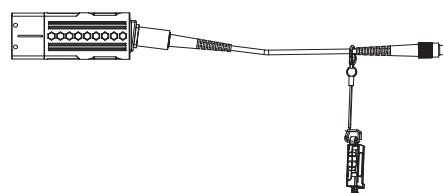
Attaching the Strap to Protective Cap

1 **Attach the supplied strap to the protective cap.**
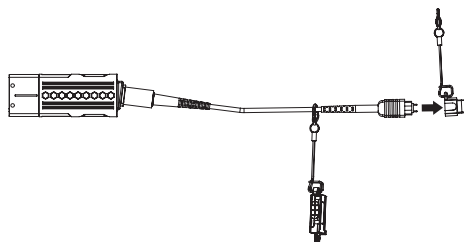
● **ZW-7000 Series**
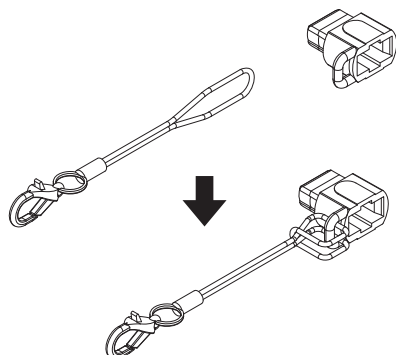
Important

• When attaching the protective cap with its strap to the fiber cable, be careful so as the protective cap or strap do not catch when you thread it.
• When removing the fiber cable from the Controller, make sure its protective cap is attached.
  Leaving the cable unprotected can let dirt get on the end surface and cause performance deterioration.
• When you remove the protective cap of fiber connector, keep the protective cap using optional strap.
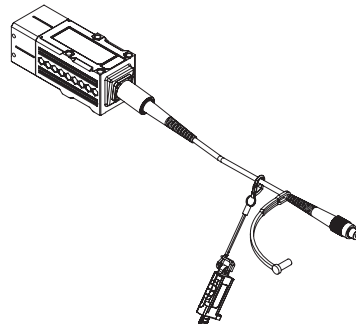
Connection of Fiber Cable and Calibration ROM

Connect the fiber connector of Sensor Head to the fiber adapter of Sensor Controller.

**1** **Remove the Protective cap of Fiber cable.**

● **ZW-7000 Series**   ● **ZW-5000 Series**

2   **Connect the Fiber cable and Cariblation ROM to the Sensor Controller.**

● **ZW-7000 Series**

Mate the convex section on the fiber connector with the groove on the fiber adapter.
**Make sure to have the bush section of the Fiber cable when you connect to the Fiber cable.**

Cariblation
ROM

Groove of fiber
adapter

Fiber cable

Convex of fiber connector

Fiber
adapter

Fiber connector

Convex of fiber
connector
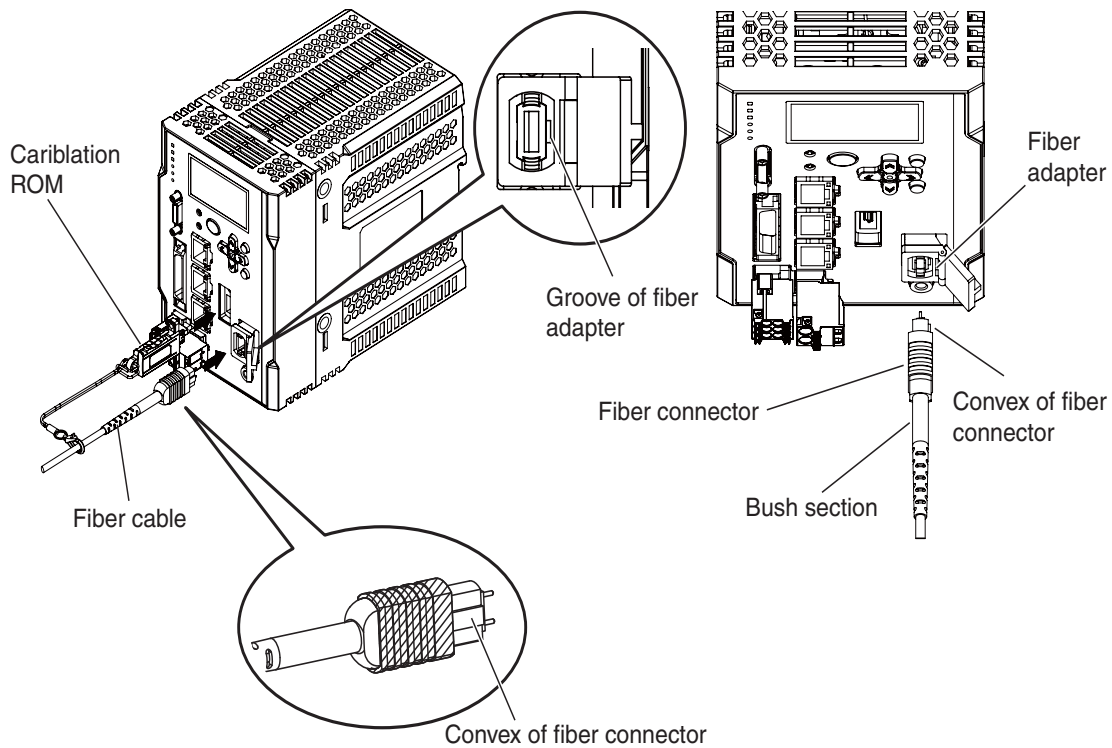
Bush section

Reference
If the resolution of PC is low, the light reception wave
might not be displayed. In this case, close displayed
item, measurement result, LED light and I/O input.

When install the Fiber cable
In right figure, have the bush section of fiber cable.
Mate the convex of fiber connector with the groove on
the fiber adapter.
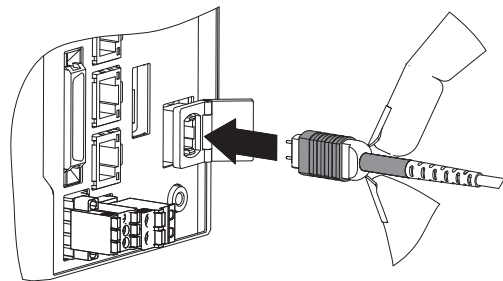
Important

If you have connector section of Fiber connector, cannot be connected correctly.

Mate the convex section of the fiber cable with the groove on the fiber connector and turn the threaded section clockwise while pushing in (see figure 1).

(figure1)

Groove section

Convex section

Threaded section

Fiber connector   Fiber adapter

（figure2）

○ ✕

（figure3）

○ ✕
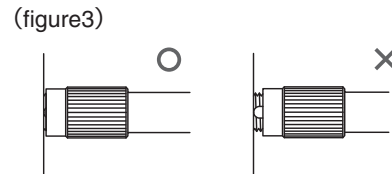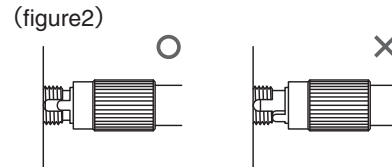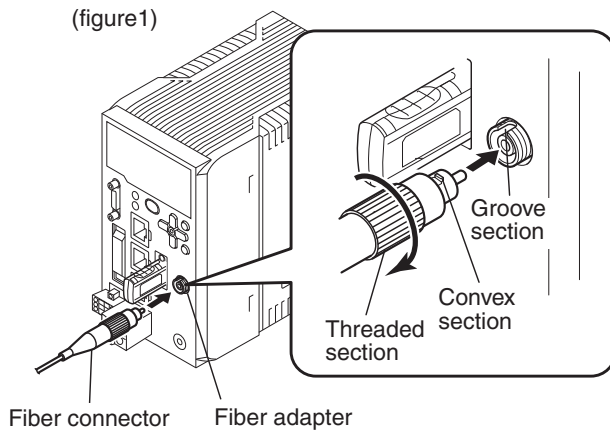
In the "No good" status in figure 2 and figure 3, optic signals cannot be transmitted and correct measurement is not possible. Always check that the system is in the "Good" status.

3 **Connect the calibration ROM to the Sensor Controller, and then tighten the supplied M2 screw.**
Tightening torque: 0.15 N · m max.

M2 screw

Calibration ROM   ROM connector
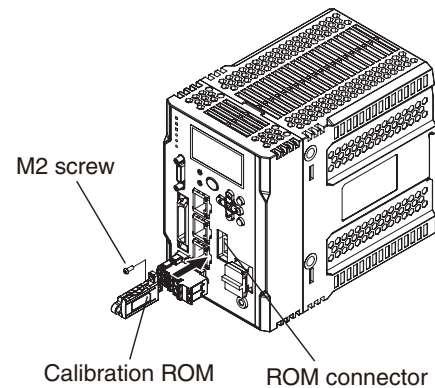
Important

- Before connecting or disconnecting the calibration ROM, make sure that the Sensor Controller's power supply is turned OFF. The Sensor Controller may break down if the calibration ROM is connected while the power is ON.
- Use with the Calibration ROM always connected. If the Calibration ROM is not connected, the error message "SYSERR" is shown in the main digital and "NO.ROM" is shown in the sub digital, where measurement is not possible.
  If the Calibration ROM is lost, or fails, refer to p.176.

  📖 "6-1 Error Messages" described in Displacement Sensor ZW-7000 series Confocal Fiber Type Displacement Sensor User's Manual for Communications Settings (Z363)

- Be sure to use a Sensor Head and Calibration ROM with the same serial number. A pair with different serial numbers cannot operate normally.
- Make sure to initialize the Sensor Controller when connecting a different type Sensor Head which is used at the last launch to the Sensor Controller.

Remove the Fiber cable

ZW-7000 Series

1 **When you remove the fiber connector, make sure to have the black part of the connector which indicated the right figure.**

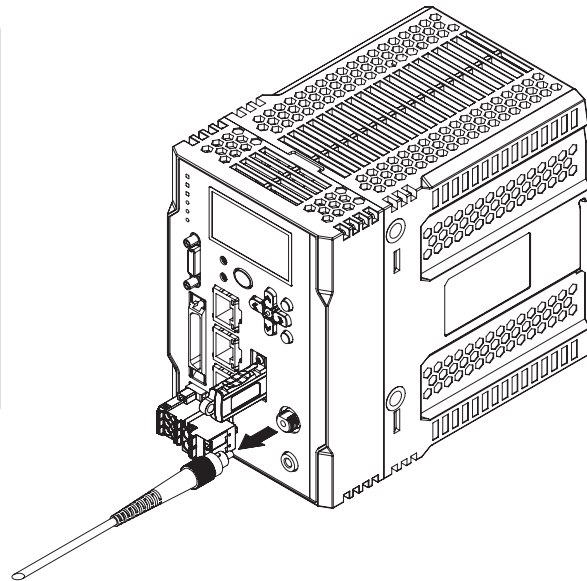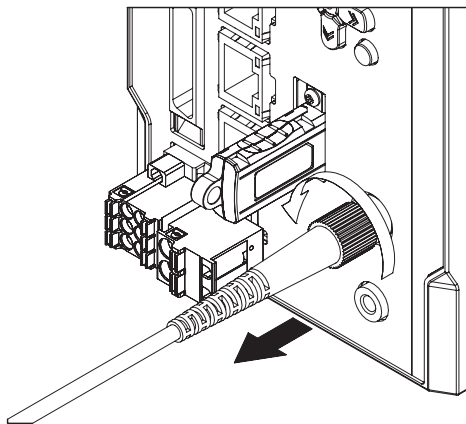Have the fiber connector (black part) illustrated under figure, and then pull out the direction of the arrow.
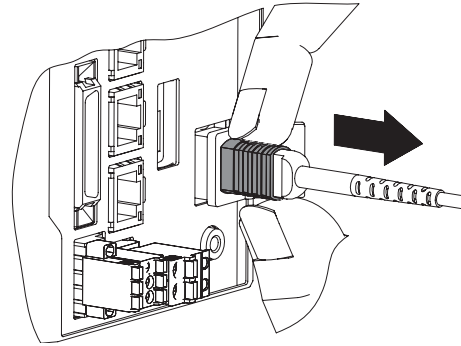
Important

If you have the bush section of fiber cable, that part may be out of place.
Make sure to have the fiber connector section.

ZW-7000 Series

1 **Turn the threaded section of the fiber connector counter-clockwise. When the screw comes off, pull the cable out.**

Important

- Handling fiber cables

  Use them in compliance with the following. This may result in damage to the fiber cable.
  - Fiber cable bend radiuses must be at least 20 mm.
  - Do not yank hard on a fiber cable.
  - Do not step on a fiber cable or place anything heavy on it.
  - Do not apply any twisting stress to the fiber cable.
  - Do not forcefully insert, or bend, or twist in a manner that would cause stress on the fiber connector when connecting it.
  - Do not let bending cause stress at the root section of a fiber connector and connection.
- Do not touch the end surface of a fiber cable, or the cable may be degraded in performance. Should the end surface be touched or soiled, wipe the dirt away using a commercially available cleaner exclusive for fiber or dry and soft cloth. Do not use a cloth moistened with alcohol, or the dirt may be reattached.
- Use optional ZW-XCL or commercially available fiber cleaner when cleaning the groove of the fiber connector. For how to clean the fiber connector using ZW-XCL, refer to the Cleaning the fiber connector and fiber cable using ZW-XCL (p.60).
- If you frequently insert and extract the Sensor Head, recommend to use the commercially available fiber cleaner which can use repeatedly.

● **ZW-7000 Series**

Product name	Model	Manufacture
NEOCLEAN-M	ATC-NE-M1	NTT Advanced Technology Corporation

● **ZW-5000 Series**

Product name	Model	Manufacture
OPTIPOP R1	ATC-RE-01	NTT Advanced Technology Corporation

- Contact

  [Request for an Estimate]

  URL http://www.ntt-at.com/product/optical_cleaner/Distributors.html

  [Technical and other inquiries]

Company	NTT Advanced Technology Corporation
Address	Muza Kawasaki Central Tower, 1310
	Omiya-cho Saiwai-ku, Kawasaki-shi,
	Kanagawa, 212-0014, Japan
TEL	+81 44 589 5894
URL	http://www.ntt-at.com/product/optical_cleaner/Distributors.html

- When you remove the fiber cable from Sensor Controller, make sure to attach the protective cap. If you do not attach it, it is possible that some contaminants may have adhered and may cause degradation of performance.
- Calibrate the Sensor Head after removing and inserting a fiber cable.

  📖 Calibrating Sensor Head p.66

- For checking the fiber is broken, confirm the followings.

  Confirm by looking the Sensor head is lighting with connecting to Sensor Controller. To put the diffraction, i.e.. a paper to around the measurement center of Sensor head, you can confirm by looking.

  When the measurement of the high reflection, you may not confirm by looking due to adjustment of intensity automatically.
- Cleaning the fiber connector and fiber cable using ZW-XCL, follow the procedures.

Cleaning the fiber connector and fiber cable using ZW-XCL
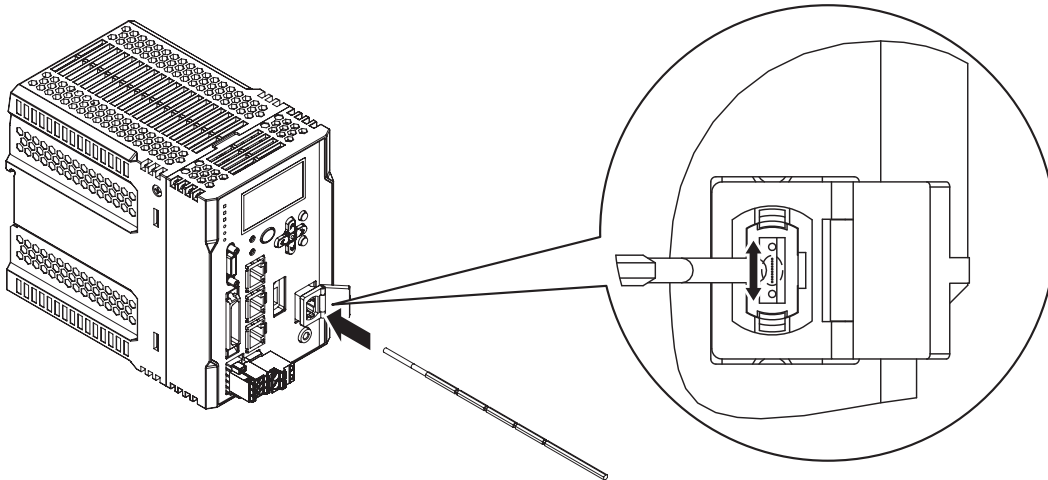
For ZW-7000 Series

1 **Taking out a cleaner**
Don't dirty the top of the cleaner, and take one cleaner
from the package.
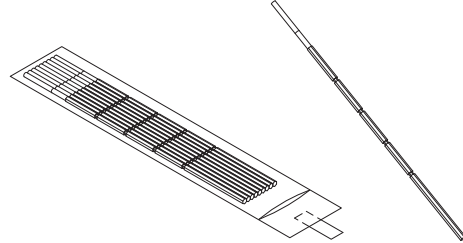
2 **Cleaning the fiber connector face of the Controller side.**
Open the shtter of the fiber connector, and then wipe the fiber's face around thres reciprocating.

3 **Cleaning the Sensor Head connection of the fiber cable**
Remove the cap from the fiber cable and wipe the entire
end surface of the fiber connector with about 3 passes.
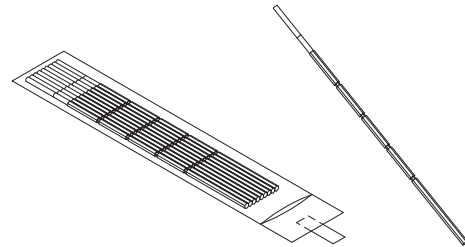Clean around the 2 guide pins as well.
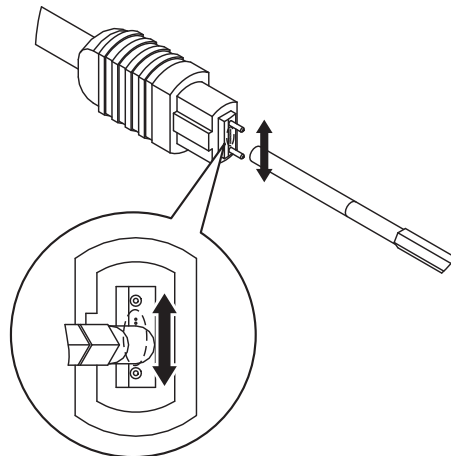
Important

• The cleaner can only be used one time. Reusing the cleaner may result in dirt or scratches on the end surface,
  causing malfunctions or measurement errors. Discard after use.
• When using a fiber cleaner, be sure to use the cloth (white end surface) on the cleaning section to clean.

1 **Taking out a cleaner**
Take one cleaner out of the bag keeping the cleaner end free of dirt.

2 **Cleaning the fiber connector face of the Controller side.**
Insert the cleaner end into the fiber connector or connection adapter, then turn it in the same direction about 3 times while pressing it against the side surface and end surface of the optical connector.

2

Installation and Connections
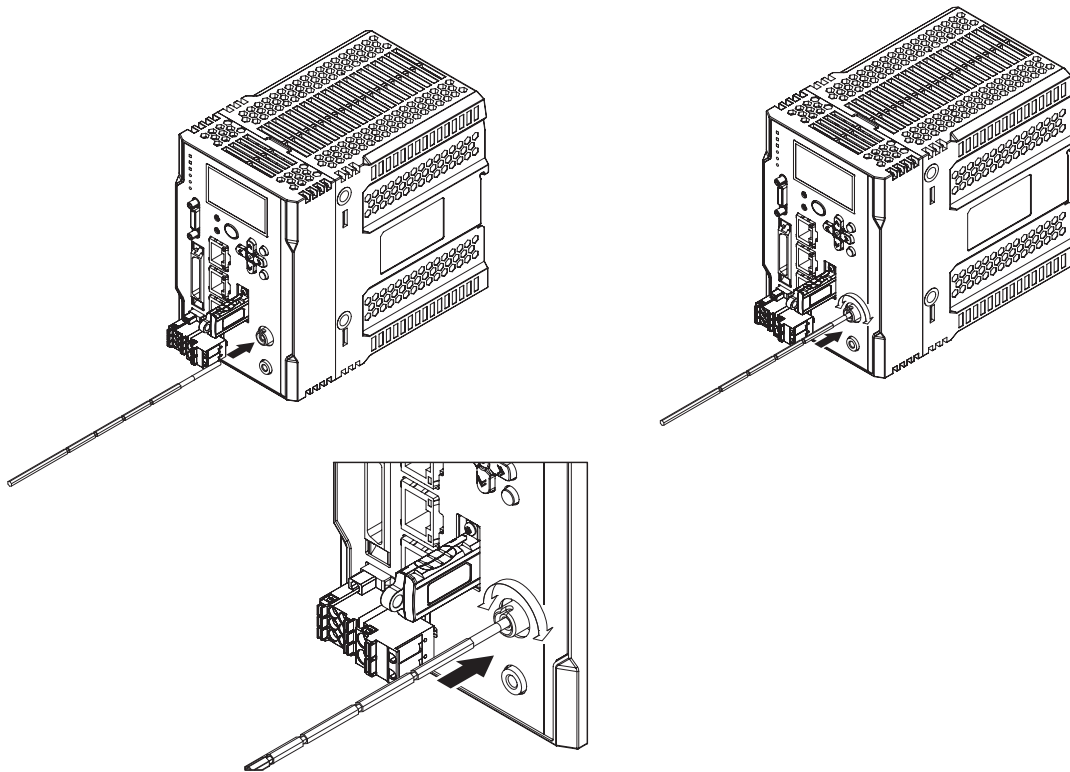
3 Cleaning the Sensor Head connection of the fiber cable

After cleaning, slowly remove the cleaner from the fiber connector or connection adapter.
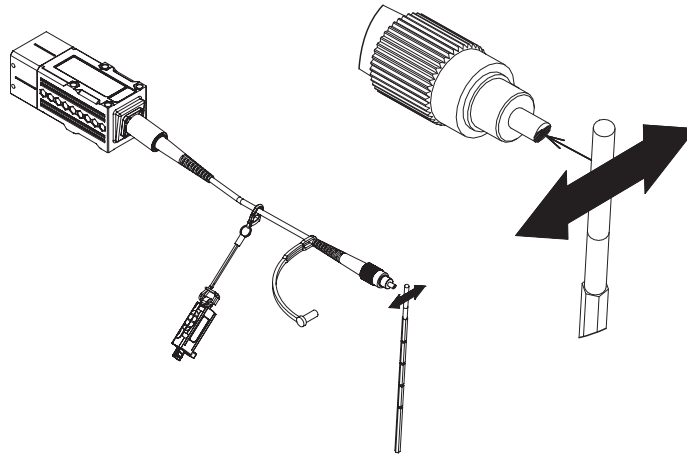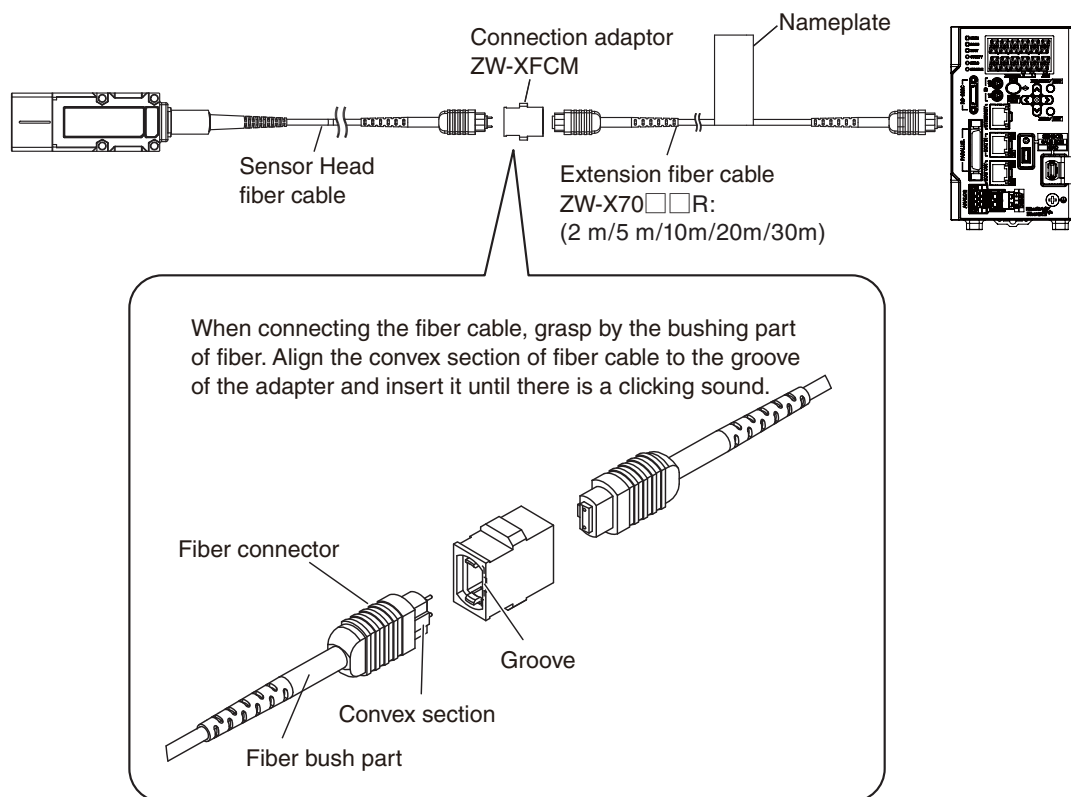
Important

• The cleaner can only be used one time. Reusing the cleaner may result in dirt or scratches on the end surface, causing malfunctions or measurement errors. Discard after use.
• When using a fiber cleaner, be sure to use the cloth (white end surface) on the cleaning section to clean.

Extending fiber cable

To extend the fiber cable on the Sensor Head, use an extension fiber cable and connecting adapter.

When extending the fiber cable, be sure to set the fiber cable length and calibrate the Sensor Head after connecting the extension fiber cable.
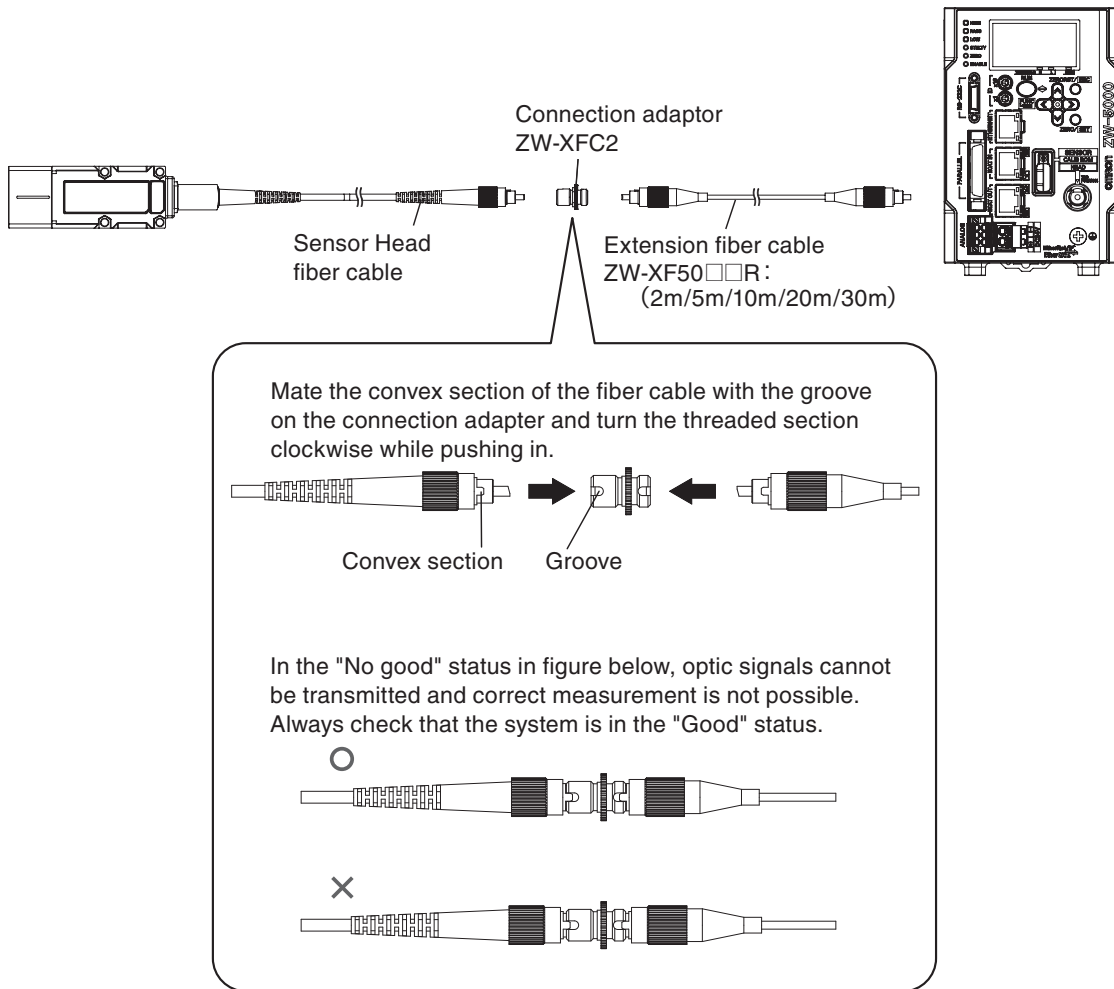
● ZW-7000 Series

Connection adaptor ZW-XFCM

Nameplate

Sensor Head fiber cable

Extension fiber cable ZW-X70☐☐R: (2 m/5 m/10m/20m/30m)

When connecting the fiber cable, grasp by the bushing part of fiber. Align the convex section of fiber cable to the groove of the adapter and insert it until there is a clicking sound.

Fiber connector

Groove

Convex section

Fiber bush part

Extension fiber cable (option)

Model	Length
ZW-XF7002R	2 m
ZW-XF7005R	5 m
ZW-XF7010R	10m
ZW-XF7020R	20m
ZW-XF7030R	30m

Connecting adapter (option)

Model
ZW-XFCM

● **ZW-5000 Series**

Connection adaptor
ZW-XFC2

Sensor Head
fiber cable

Extension fiber cable
ZW-XF50□□R :
（2m/5m/10m/20m/30m）

Mate the convex section of the fiber cable with the groove
on the connection adapter and turn the threaded section
clockwise while pushing in.

Convex section   Groove

In the "No good" status in figure below, optic signals cannot
be transmitted and correct measurement is not possible.
Always check that the system is in the "Good" status.

○

×

Extension fiber cable (option)

Model	Length
ZW-XF5002R	2 m
ZW-XF5005R	5 m
ZW-XF5010R	10m
ZW-XF5020R	20m
ZW-XF5030R	30m

Connecting adapter (option)

Model
ZW-XFC2

Important

• Handling fiber cables

Use them in compliance with the following. This may result in damage to the fiber cable.

- Fiber cable bend radiuses must be at least 20 mm.
- Do not yank hard on a fiber cable.
- Do not step on a fiber cable or place anything heavy on it.

- Do not apply any twisting stress to the fiber cable.
- Do not forcefully insert, or bend, or twist in a manner that would cause stress on the fiber connector when connecting it.
- Do not let bending cause stress at the root section of a fiber connector and connection.
• External fiber cable has the direction. Make sure to connect the name plate side to the Sensor Controller.
• When connect in the opposite direction, can not be transfer the optical signal and the correctly measurement.
• If you connect having fiber connector, cannot be connected correctly.
• Additionally, if force to connect the standard fiber cable and extension fiber cable in the opposite direction, it may be caused failure.
• For how to use the supplied strap, refer to the following; Reference mark p.26.

Important

• The connection adapter (ZW-XFCM) comes packed together with the extension fiber cable (ZW-XF70□□R).
• Never use any extension fiber cable and/or connecting adapter other than those specified in the above.
• Only one fiber cable is allowed to extend the normal fiber cable. Never use two or more extension fiber cable connected together.
• Do not touch the fiber cable face of the Sensor Head. It may cause a degrading of its efficiency.
  If you mistakenly touch or otherwise get dirt on the face, lightly wipe off the part using the following:
  -Optional item ZW-XCL
  -Commercially available fiber cleaner
  -A dry, soft cloth.
  Do not use a cloth dampened with alcohol.
  It may be occur the re-adhesion of dirt.
• For cleaning the fiber connector of the Sensor Controller, use the optional item ZW-XCL or a commercially available fiber cleaner.
• If the Sensor Head is frequently inserted and removed, the following commercially available fiber cleaners are recommended for repeated use.

● **ZW-7000 Series**

Product name	Model	Manufacture
NEOCLEAN-M	ATC-NE-M1	NTT Advanced Technology Corporation

● **ZW-5000 Series**

Product name	Model	Manufacture
OPTIPOP R1	ATC-RE-01	NTT Advanced Technology Corporation

• Contact
  [Request for an Estimate]
  URL http://www.ntt-at.com/product/optical_cleaner/Distributors.html
  [Technical and other inquiries]
  Company   NTT Advanced Technology Corporation
  Address   Muza Kawasaki Central Tower, 1310
               Omiya-cho Saiwai-ku, Kawasaki-shi,
               Kanagawa, 212-0014, Japan
  TEL   +81 44 589 5894
  URL   http://www.ntt-at.com/product/optical_cleaner/Distributors.html

• When you remove the fiber cable from Sensor Controller, make sure to attach the protective cap. If you do not attach it, it is possible that some contaminants may have adhered and may cause degradation of performance.
• Calibrate the Sensor Head after removing and inserting an optical fiber.

    Calibrating Sensor Head p.66

• To check if the fiber is broken, verify the following points:
  • When you cannot views the right spot even place within measurement range an object which diffuses light, i.e. paper while connect the fiber cable correctly, the fiber cable may be damaged. In this case, need to repair. Contact your OMRON representative.
    When inspect a object with high reflectivity, visually check may not be allowable. Use and conform a diffused object.
  • For cleaning of fiber connector and fiber cable using ZW-XCL, refer the following processes.

Calibrating Sensor Head

Calibrate the Sensor Head by obtaining the dark data in the no-incoming light status.
• When removing and inserting a fiber cable from/to the Sensor Controller (Including the initial connection).
• When extending a fiber cable.
• When "Dark" is shown in the main display even though a measurement object exists in the measurement range.
• When extension fiber cable

The Sensor Head should be calibrated without any object within 20mm of the measurement range or with the tip of the Sensor Head shielded from light with an object with diffuse reflection.
(Correct calibration is not possible with a transparent object, semi-transparent object, or mirror.)

• Without any object   • With light shielded
 within the measuring range

Sensor head   Sensor head

                                              Install with the tip of the Sensor Head
                                              shielded by an object with diffuse reflection,
                                              such as metal, paper, or plastic.

Measuring range   Measuring range
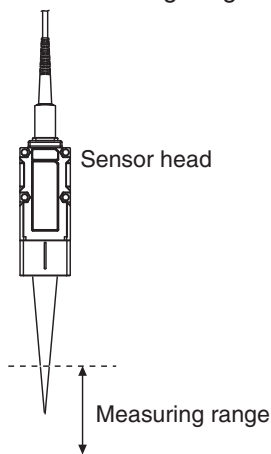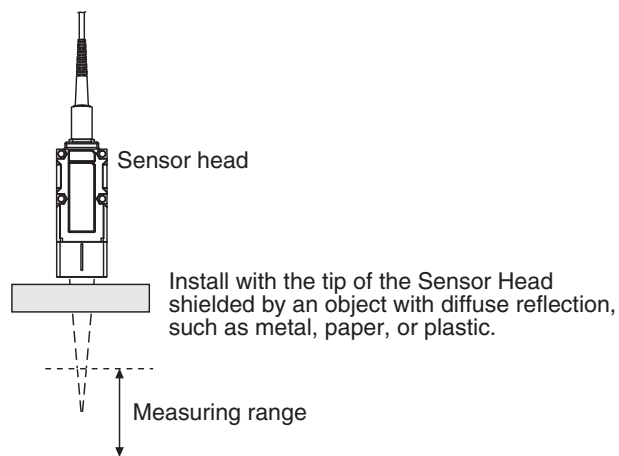
1 **Set the operation mode to FUNC mode.**

▶ **Multi-view explorer: [System] (double-click)**
  → Edit window: [Sensor Settings] icon (▨)
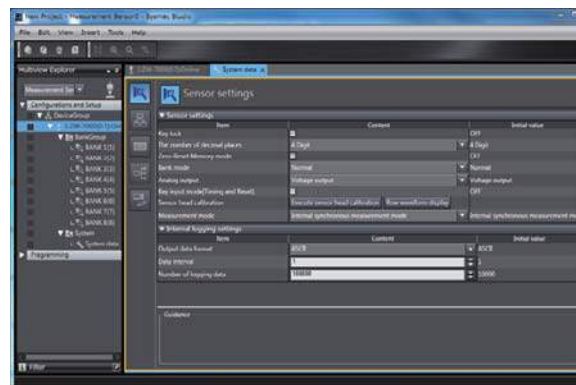
2 Select the cable length of the extension fiber cable.
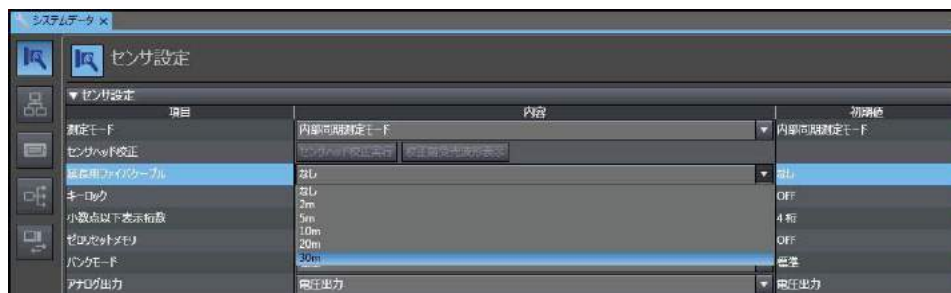
▶ **Multi-view explorer : [System] (double-click)**
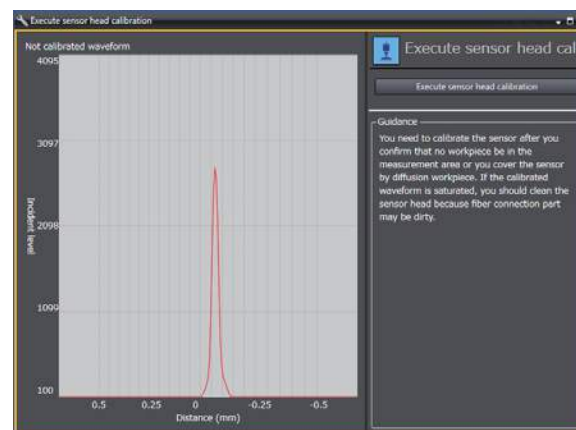**→ Edit window: [Sensor Settings] icon (🔲)**

3 Click [Sensor head calibration].
The [Sensor head calibration] window is appears.

4 Click [Execute sensor head calibration].
The waveform of received light before calibration and the waveform of received light after calibration are shown.

- The calibration data is stored inside the Sensor Controller. Therefore, if the sensor head is calibrated once, as long as the fiber connection state does not change (if it is not disconnected from or connected to the Sensor Controller or an extension added), this operation is not needed each time.

- **When Sensor Head calibration fails**

  If the Sensor Head is calibrated in an inappropriate environment, an error is displayed on the main display. In such a case, refer to the p.66, recheck your environment, and try again. If an error results even if Sensor Head calibration is done under the correct conditions, it is possible that some contaminants may have adhered to the Sensor Head part, or the fiber connector of the Sensor Controller. Clean the fiber cable or fiber connector referring to p.59. After cleaning the fiber or fiber connector, be sure to calibrate the Sensor Head again.

- A warning message stating that Re-adjustment is required will appear on the Multiview Explorer window for the following.
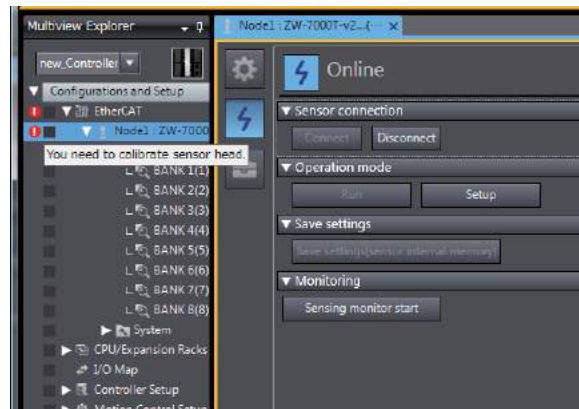
Calibrating Sensor Head can also be set by the operating keys on the Sensor Controller.

Calibrating Sensor Head p.247

2-4 Wiring

32-pole extension connector

Used for judgment output, control input, etc.
    Compatible connector: FX2B series (Hirose Electric Co., Ltd.)
    A parallel cable (ZW-XCP2E) for an extension connector with 2 m cable is included.
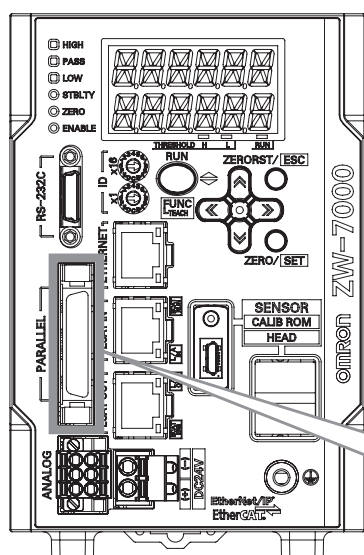
Color(*1)	Signal name	No.(*2)		Signal name	Color(*1)
Blue	COM_IN1	B16	A16	COM_IN2	Blue
Green	TIMING	B15	A15	SYNC/TRIG	Green
Yellow	RESET	B14	A14	NC	Yellow
Orange	ZERO	B13	A13	NC	Orange
Red	LIGHT OFF	B12	A12	NC	Red
Brown	COM_OUT1	B11	A11	COM_OUT3	Brown
Black	HIGH	B10	A10	STABILITY	Black
White	PASS	B9	A9	LOGERR	White
Gray	LOW	B8	A8	LOGSTAT	Gray
Purple	ALARM	B7	A7	SYNCFLG/TRIGBUSY	Purple
Blue	BUSY	B6	A6	TASKSTAT	Blue
Green	ENABLE	B5	A5	COM_IN3	Green
Yellow	COM_OUT2	B4	A4	BANK_SEL1	Yellow
Orange	BANK_OUT1	B3	A3	BANK_SEL2	Orange
Red	BANK_OUT2	B2	A2	BANK_SEL3	Red
Brown	BANK_OUT3	B1	A1	LOGGING	Brown

*1 Indicates ZW-XCP2E code color

Important

Cut the unnecessary signal lines so that they do not touch other signal lines.

Class	Name	Description
Parallel output	HIGH output	This outputs judgment results - HIGH (HIGH threshold values < Measured value).
	PASS output	This outputs judgment results - PASS (LOW threshold values $\leq$ Measured value $\leq$ HIGH threshold values).
	LOW output	This outputs judgment results - LOW (LOW threshold values > Measured value).
	ALARM output	This turns ON when there is a system error.
	BUSY output	This turns ON during sampling with the hold function enabled. It allows you to check whether or not the self-trigger is functioning correctly. It also turns ON during bank switching.
	ENABLE output	This turns ON when the sensor is ready for measurement. This output is interlocked with the ENABLE indicator.
	BANK_OUT output	This outputs the currently specified bank number. It expresses the bank number in combinations of BANK_OUT1, 2 and 3.

Bank Number	BANK_OUT1	BANK_OUT2	BANK_OUT3
BANK1	OFF	OFF	OFF
BANK2	ON	OFF	OFF
BANK3	OFF	ON	OFF
BANK4	ON	ON	OFF
BANK5	OFF	OFF	ON
BANK6	ON	OFF	ON
BANK7	OFF	ON	ON
BANK8	ON	ON	ON

Class	Name	Description
	SYNCFLG/TRIGBUSY output	In the internal/PDO synchronized mode, this output operates as SYNCFLG. This turns ON when measurement synchronization processing is executed by SYNC input and the state changes to one where normal measurement values can be output. In the external synchronous measurement mode, this output operates as TRIGBUSY. This turns ON while a measurement by TRIG input is being performed. The next TRIG input cannot be turned ON until this turns OFF.
	STABILITY output	This turns ON when 1surface is within the measurement range. This output is interlocked with the STABILITY indicator.
	LOGSTAT output	This turns ON while internal logging is in execution.
	LOGERR output	This turns ON when internal logging fails. Turns ON when the logging results is saved the maximum number, retry to execute the inside logging. If the LOGGING signal turns OFF, LOGERR signal is also turned OFF.
	TASKSTAT output	This turns ON when the measurement value is finalized.

In FUNC mode, output of each signals are the followings;

- BUSY output Turns ON

- BANK_OUT   Outputs the current bank number

- Other signals Turns OFF

Class	Name	Description
Parallel input	ZERO input	This is used to execute and clear a zero reset.
	RESET input	This resets all executing measurements and outputs. While a RESET is being input, judgment output conforms to the non-measurement setting. If this RESET input switches ON while the hold function is used, the state in effect before the hold function was set will be restored.
	TIMING input	This is a signal input from an external device that is used to time the hold function with the continuous measurement function enabled. This is a signal input from an external device that is used to time the measurement with the trigger measurement function enabled.
	LIGHT OFF input	This LIGHT-OFF signal puts out the measurement LED. While LIGHT-OFF is being input, the analog output, binary output, and judgment output conform to the non-measurement setting.
	BANK_SEL input	This is used for switching banks. Specify the bank number in combinations of BANK_SEL1, 2 and 3. However, if the bank mode is set to "JUDGMENT", the bank cannot be switched at the external signal input because the number of banks increases to 32.
	LOGGING input	This is used to start and end internal logging.
	SYNC/TRIG input	In the internal/PDO synchronized mode, this is a signal input (SYNC input) used in order for the multiple ZWs to perform synchronization of measurements (image capture) at the same time. In the external synchronous measurement mode, this is a signal input (TRIG input) used in order to decide the measurement (image capture) timing.

Within the BANK_SEL input description:

Bank Number	BANK_SEL1	BANK_SEL2	BANK_SEL3
BANK1	OFF	OFF	OFF
BANK2	ON	OFF	OFF
BANK3	OFF	ON	OFF
BANK4	ON	ON	OFF
BANK5	OFF	OFF	ON
BANK6	ON	OFF	ON
BANK7	OFF	ON	ON
BANK8	ON	ON	ON

Analog output terminal block

Used for analog output.

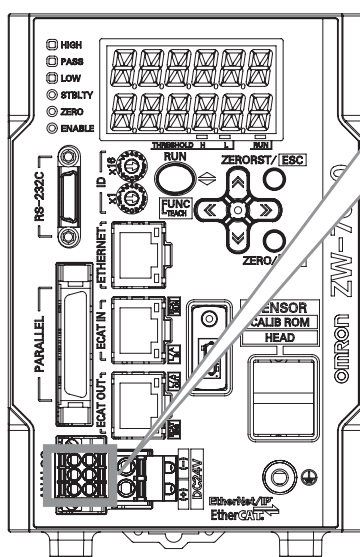Compatible cable specifications: Solid wire 0.2 to 1.5 mm^2
Stranded wire 0.2 to 1.5 mm^2
Stranded wire with rod terminal(no plastic sleeve) 0.25 to 1.5 mm^2
Stranded wire with rod terminal(with plastic sleeve) 0.25 to 0.75 mm^2
AWG 24 to 16
Pin processed length 10 (±0.5) mm

Signal name	No.		Signal name
OUT(V)	1	4	NC
OUT(A)	2	5	NC
OUT 0V	3	6	NC

| Class	Name	Description
Analog output	OUT (V)	This outputs the measured value, from -10 V to +10 V as the voltage value. When measurement not possible: Approx. +10.8 V (default value; can be selected by user) Alarm: Approx. 10.8 V
	OUT (A)	This outputs the measured value, from 4 mA to 20 mA as the current value. When measurement not possible: Approx. +20.8mA (default value; can be selected by user) Alarm: Approx. +20.8 mA
	OUT 0V	0 V for analog voltage output.

Important

- Cut the unnecessary signal lines so that they do not touch other signal lines.
  Make the wire length as short as possible. Do not use a wire length of over 30 m.
- Analog output is not possible under the following combination of conditions.
  Measurement cycle is less than 40 µs.
  EtherCAT output is enabled.
- Make sure to fix the terminal block to prevent be injure when pushing the release button with a screw driver.

1 Loosen the two fixing screws using a screwdriver to remove Analog output terminal block from the Sensor Controller.
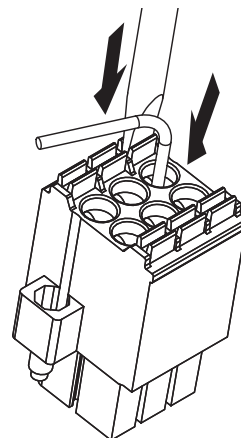
Fixing Screws
(both end)
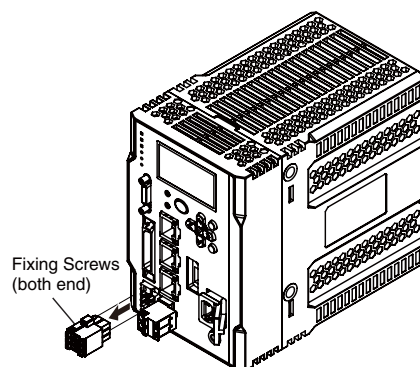
2 Insert the wire in to the terminal hole.
• When you use a wire attached rod terminal, you can insert just with Push-IN.
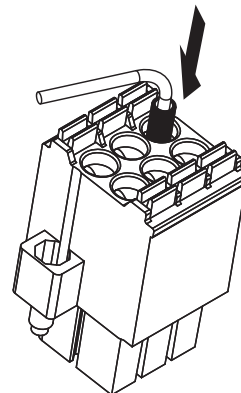
• When using single wire, or stranded wire
Insert the wire deeply in to the terminal hole while pushing the release button on the side of terminal hole using a screwdriver.

3 Reinstall the Analog output terminal block to the Sensor Controller.

Important

• After the connection has been established, pull the wire gently, to make sure that the connection has been made securely.
• Being careful not to accidently be injured when pushing the release button with a screwdriver, make sure to tightly secure to the terminal block.

24 V input terminal block

Used for 24 VDC power supply.

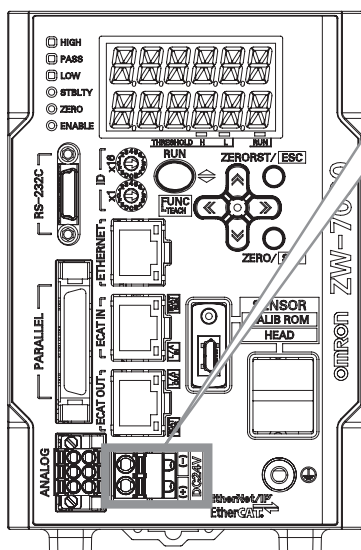Compatible cable specifications: Solid wire 0.2 to 2.5 mm^2

Stranded wire 0.2 to 2.5 mm^2

Stranded wire with rod terminal(no plastic sleeve) 0.25 to 2.5 mm^2

Stranded wire with rod terminal(with plastic sleeve) 0.25 to 2.5 mm^2

AWG 24 to 12

Pin processed length 10 (±0.5) mm

No.	Signal name
1	DC24V (−)
2	DC24V (+)

| Class	Name	Description
Power Supply	DC24V (+)	Terminal for external power supply (24 V)
	DC24V (−)	Terminal for external power supply (0 V)

Important

- Wiring with the power on could result in a short-circuit or electric shock. Wire with the power off.
- Wire the power supply separate from other devices. Wiring together with other devices or using the same duct could cause a false operation or damage the sensor.
- Do not turn off the power during initial processing immediately after the Sensor Controller power is turned on, as the memory inside the Sensor Controller is being accessed. This may corrupt the data.
- Securely fasten the terminal block to prevent injury when you press in the release button with a screwdriver.
- Use the electric cable within 2m.

**1** **Remove the 24 V input terminal block to the Sensor Controller.**
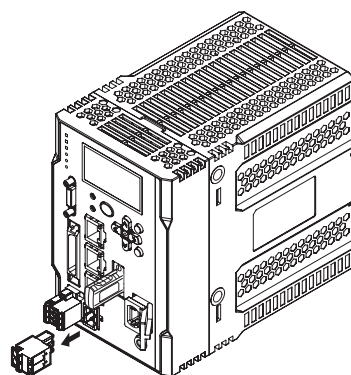
2 **Insert the cord to the terminal hole.**
   • When you use a wire attached rod terminal, you can insert just with Push-IN.

Release button
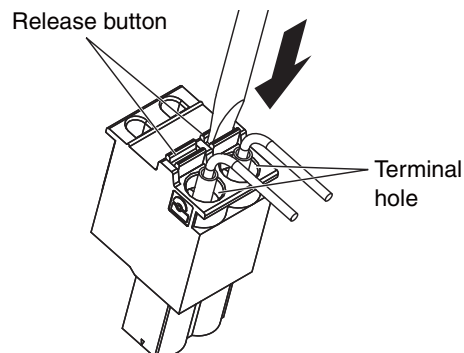
Terminal hole

   • When using single wire, or stranded wire
     Insert the wire deeply in to the terminal hole while pushing the release button on the side of terminal hole using a screwdriver.
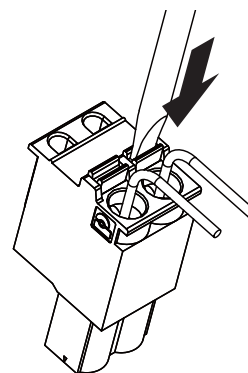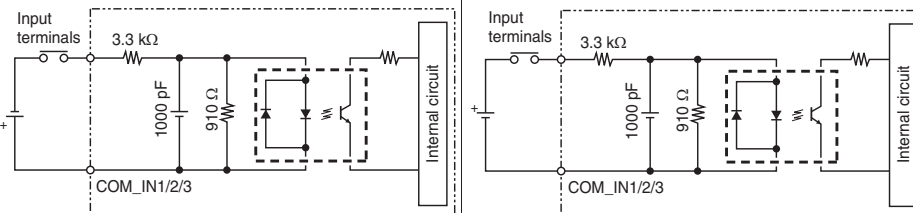
Important

• After the connection has been established, pull the wire gently, to make sure that the connection has been made securely.
• Securely fasten the terminal block to prevent injury when you press in the release button with a screwdriver.
• Do not use 24V power terminal block which is used in ZW-CE series.

3 **Reinstall the 24 V input terminal block to the Sensor Controller.**

Electrical Specifications

Input circuit

Item	Specifications	
Model	ZW-7000□/5000□	
Input type [1]	For NPN connection	For PNP connection
Input voltage	DC24 V±10 % (21.6 to 26.4 V)	DC24 V±10 % (21.6 to 26.4 V)
Input current	7 mA Typ. (DC24 V)	7 mA Typ. (DC24 V)
ON voltage/ON current [2]	19 V min./3 mA min.	19 V min./3 mA min.
OFF voltage/OFF current [3]	5 V max./1 mA max.	5 V max./1 mA max.
ON delay	0.1 ms max.	0.1 ms max.
OFF delay	0.1 ms max.	0.1 ms max.
Internal circuit diagram [4]		

*1 NPN/PNP dual type. According to the specifications of the external equipment, ensure proper wiring.

*2 ON voltage/ON current
  This is the voltage value or current value that makes the signal go OFF to ON.
  The ON voltage value becomes the potential difference between COM IN 1/2/3 and the input terminals.
*3 OFF voltage/OFF current
  This is the voltage value or current value that makes the signal go ON to OFF.
  The OFF voltage value becomes the potential difference between COM IN 1/2/3 and the input terminals.
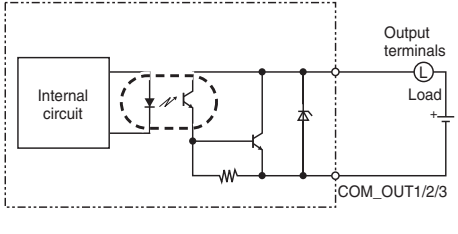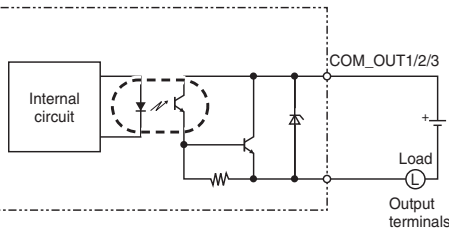*4 Below is a table giving the COM_IN (input common) and input signal connection correspondence.

Terminal name	COM_IN1	COM_IN2	COM_IN3
Input signal name	TIMING	SYNC/TRIG	BANK_SEL1
	RESET		BANK_SEL2
	ZERO		BANK_SEL3
	LIGHT OFF		LOGGING

Important

Chattering countermeasures

• Set the width of input signal filter (5μs to 1000μs) to prevent incorrect input due to chattering.

• Always use non-contact relays (SSR, PLC transistor output) for input signals. If contact relays are used, contact bounding may turn ON a TIMING input again during measuring.

Output circuit

Item	Specifications	
Model	ZW-7000☐/5000☐	
Output type [*1]	For NPN connection	For PNP connection
Output voltage	DC21.6 to 30 V	DC21.6 to 30 V
Load current	50 mA max.	50 mA max.
ON residual voltage	2 V max.	2 V max.
ON leakage current	0.1 mA max.	0.1 mA max.
Internal circuit diagram [*2]		

*1 NPN/PNP dual type. According to the specifications of the external equipment, ensure proper wiring.

*2 Below is a table giving the COM_OUT (output common) and output signal connection correspondence.

Terminal name	COM_OUT1	COM_OUT2	COM_OUT3
Output signal name	HIGH	BANK_OUT1	STABILITY
	PASS	BANK_OUT2	LOGERR
	LOW	BANK_OUT3	LOGATAT
	ALARM		SYNCFLG/TRIGBUSY
	BUSY		TASKSTAT
	ENABLE		

Important

- Connect a load that matches the output specifications. Short-circuit can cause sensor breakdown.
- Keep the load current less than or equal to the specification value. Exceeding the specification value could cause damage to the output circuit.

2-5 Installing the Sysmac Studio

The PC Tool used to set up ZW-7000 Series Displacement Sensors is installed from the Sysmac Studio Installer. Refer to the *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504) for the system requirements and installation procedure.

2-6 Launching a project

Connecting to the sensor with Sysmac Studio Measurement Sensor Edition

Creating a new project

Create a new project, add a sensor to the project, then start communicating with the sensor.

1 **Start up the PC tool.**

2 **Create a new project.**
Click [New Project] and select [Displacement Sensor] from [Category] under [Select Device], and [ZW] from [Device].
Then enter [Project name], [Author], and [Comment].
Click [Create] to create a blank project.

> **Note**
>
> If there are existing projects, click [Open Project]. A list of the projects is displayed. Select the project you want to open and click [Open].
> If an existing project is opened, it starts up in offline mode. For the details of offline mode, see below.
>
> 📖 Chapter 6 Offline Settings p.183

3 **Specify the sensor to connect using one of the methods below.**
• Directly specify the IP address of the sensor to connect.
Check the [Specify a sensor] box.
Directly enter the IP address. Click [Confirm], and then click [OK].
• When not connected with the sensor (offline)
When setting a project offline without connecting to the actual sensor, check [Enter the type] to select.
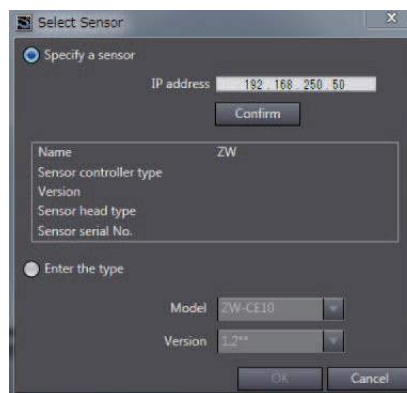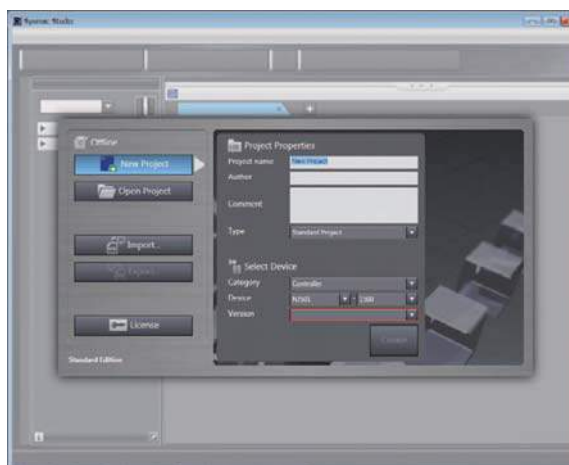Then, select the sensor model and software version to use and click [OK].
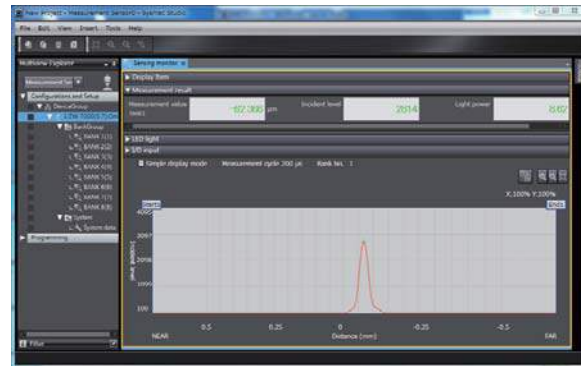
📖 Chapter 6 Offline Settings p.183

> **Note**
>
> By default, the Sensor Controller has an IP address of 192.168.250.50

📖 3 Basic Operation p.87

4 **After the sensor is connected, the following window appears.**
Sensing monitor window appears on the Edit pane. The sensor starts up in RUN mode.

Adding a sensor to a project

After the project is created, additional sensors can be added to the project.

▶ **Multi-view explore**   **: [Device Group] (right click) | [Add] | [ZW]**

Entering project information

Comments about the project can be entered.

▶ **Multi View Explore**   **: [Device Group] | [(Sensor Name)] (double click)**
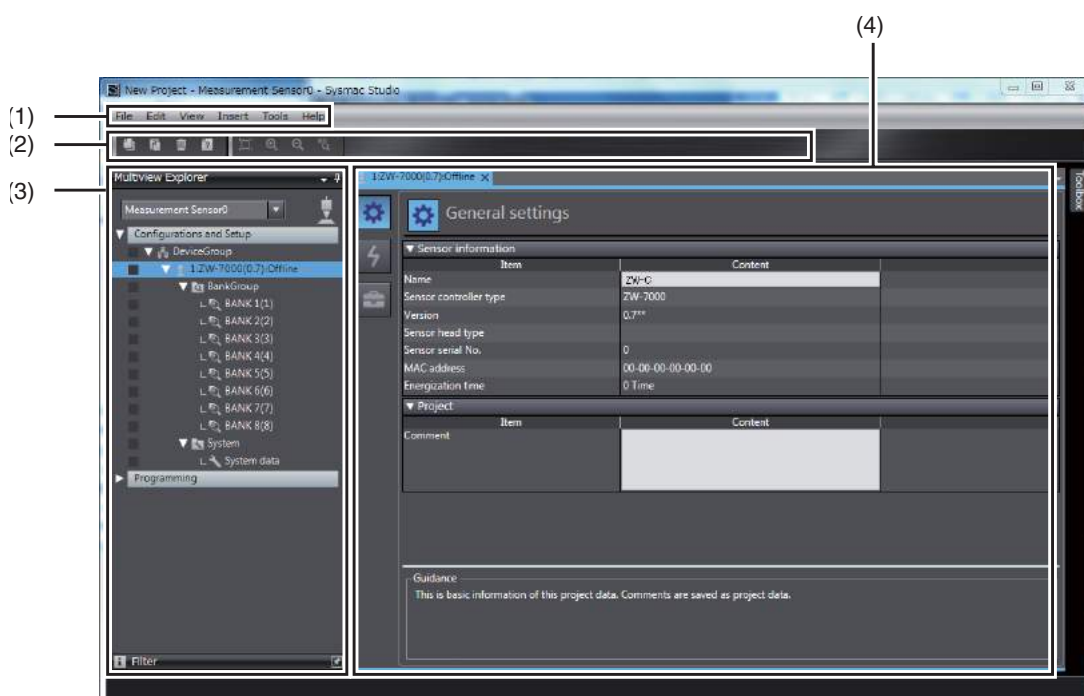   **→ Edit pane**   **: [General Settings] icon (⚙)**

1 **Enter comments for the project in the [Comment] field.**

# 2-7 Explanation of Screen Sections

PC tool

The following summarizes the names and functions of the window sections of Sysmac Studio.

Sysmac Studio Main window

No.	Name	Description
(1)	Menu bar	Menu items that can be used with this tool is displayed.
(2)	Toolbar	Tool functions that can be used with this tool is displayed with icons.
(3)	Multi View Explore	Displays the data hierarchy of the sensor with a hierarchy tree. Double clicking each data displays Main pane, Bank data edit pane, and System data edit pane on the Edit pane.
(4)	Edit pane	Edits and displays data selected in the Multi View Explore. It mainly consists of Menu icon, setting items, and properties.

Multi-view explore
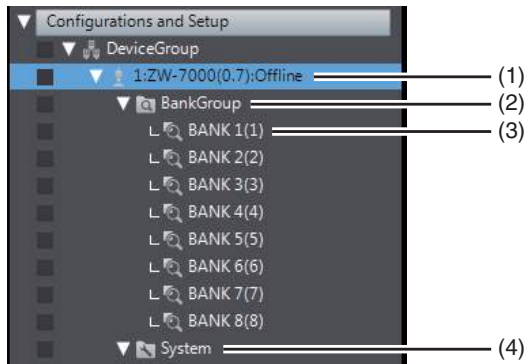
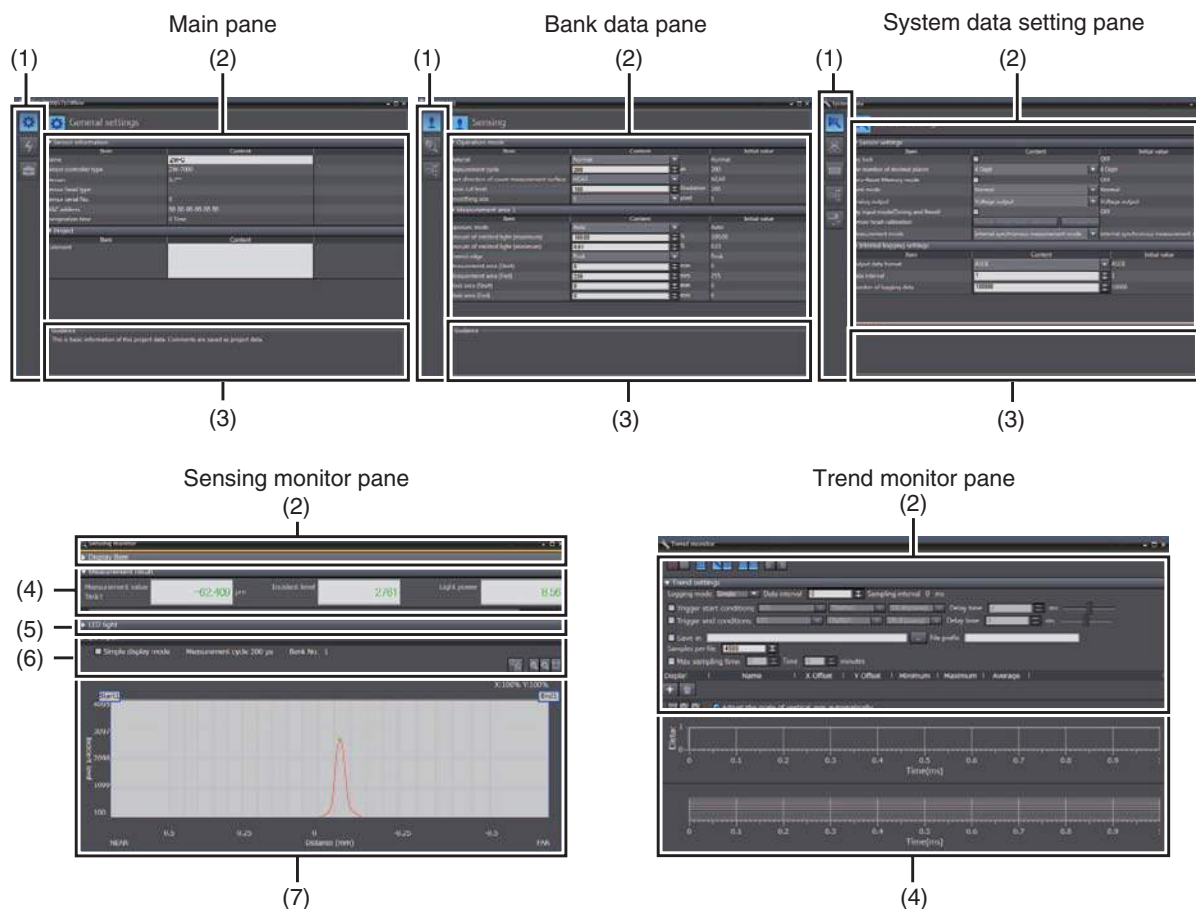| No.	Name	Description
(1)	Sensor model	Displays the sensor model. Displays online/offline status at the end.
(2)	Bank group	This is a group of bank data. Bank data can be registered up to 8 in NORMAL mode, and up to 32 in JUDGMENT VALUE mode.
(3)	Bank data	This is used to set functions to perform measurements. It consists of sensing setting, task setting, and I/O setting.
(4)	System data	System data common to all banks.

A list of menu items displayed with right click

Tree view items	Menu	Description
Device group	Add | ZW	Adds a sensor to the project.
	Paste	Pastes the copied sensor to the project.
	Rename	Changes the device group name.
Sensor model	Edit	Displays the main pane as the Edit pane.
	Delete	Deletes a sensor from the project.
	Copy	Copies a sensor.
	RUN	Switches the sensor to RUN mode.
	FUNC	Switches the sensor to FUNC mode.
	Online	Switches the connection status with the sensor to online.
	Offline	Switches the connection status with the sensor to offline.
	Sensing monitor	Displays the sensing monitor in the edit window.
	Trend monitor	Displays the trend monitor in the edit window.
	Save settings	Save the sensor settings data to nonvolatile memory.
	Initialize Sensor	Initialize the sensor.
	Restart	Restart the sensor.
	Print	Setting data is printed.
Bank data	Edit	Displays the bank data edit pane as the Edit pane.
	Copy	Copies a bank data.
	Paste	Overwrites the bank data. [*1]
	Initialize	Deletes (initializes) bank data.
	Rename	Changes the bank data name.
System data	Edit	Displays the system data edit pane as the Edit pane.
	Copy	Copies system data.
	Paste	Overwrites system data. [*1]

*1 Overwrite is possible between the same series of ZW (between ZW-C☐ series or between ZW-7☐ series).

Edit pane

The Edit Pane changes as shown below based on what is selected in the Multi View Explore.

Main pane

Bank data pane

System data setting pane

Sensing monitor pane

Trend monitor pane

| No.	Name	Description
(1)	Menu icon	Parameters to be edited on each edit pane can be changed.
(2)	Setting item	Each setting item can be edited.
(3)	Guidance	The description of the focused setting item is displayed.
(4)	Measurement value monitor	The selected measurement results or output values are displayed.
(5)	LED light	The status of each LED light is displayed when online.
(6)	I/O input	The status of I/O signals can be switched when online.
(7)	Line bright monitor	The line bright is displayed.

List of icons

(1) Menu icon

| Edit pane type	Icon	Menu name	Description
Main pane		General settings	Sensor project information can be verified.
		Online	Switching between online and offline connections with the actual sensors, and switching the operating mode can be performed. Also, the internal logging process, saving set data, monitoring the measurement results can be performed.
		Tool	The initialization or upgrading the version of the actual sensor can be performed.
Bank data edit pane		Sensing	Switching the operation mode (1 area/2 area), and setting exposure time and measurement areas can be performed.
		Task 1	Allows you to perform setting to calculate the feature amounts of height, thickness and calculation using scaling, filter, and hold processes. Settings can be made individually for the task 1 to 4.
		I/O	Allow you to make settings for judgment output, and analog output.
System data setting pane		Sensor settings	Allows you to make sensor settings such as bank mode or analog output.
		Ethernet communication settings	Allows you to make settings for Ethernet communication.
		RS-232C communication settings	Allows you to make settings for RS-232C communication settings.
		Data output settings	Edit the data output settings.
		I/O setting	Specify the settings related to parallel input and output.

(2) Operation icons

Sensing monitor window

Icon	Name	Description
	Zoom in	Zoom in the line bright.
	Zoom out	Zoom out the line bright.
	Fit to frame	Change the size of the line bright so it fits the window size.
	Export	Saves the line bright being displayed.

Trend monitor window
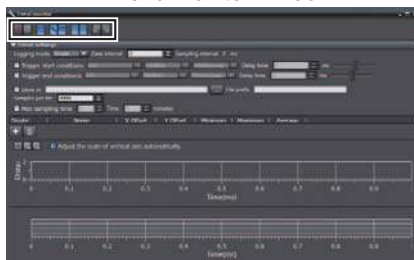
Icon	Name	Description
	Start sampling	Starts the sampling.
	Stop sampling	Stops the sampling.
	Show grid	Displays gridlines.
	Show configuration	Displays the logging condition setting window.
	Show data table	Displays the data window to be logged.
	Show Analog Chart	Displays the analog chart window.
	Show Digital Chart	Displays the digital chart window.
	Import	Imports the exported measurement results and display them on each chart.
	Export	Exports the measurement results displayed on each chart.

2-8 Saving a project

Saving a project

Save the project being edited with the PC tool.
The project to be saved has the following information.

Configuration data	Description
Project information	Information on the sensor registered in this project.
Entire sensor information	Entire sensor information.
Tool setting information	Information on tool setting parameters for each sensor registered in this project.

Note

📖 3-2 Switching operation modes p.90

Important

• Save a project data when the setting of the Sensor Controller is changed. If the power is turned off without saving, the changed setting is cleared.

📖 Saving the Bank/System Settings p.167

1 **Menu bar: Click [File] - [Save] to select.**

Exporting a project

A project data (.smc) can be exported.
The exported data can be used by importing with the other personal computer's PC tool.

1 **Menu bar: Click [File] - [Export] to select.**

Importing a project

The exported data from other personal computers can be imported as project data.

1 **Menu bar: Click [File] - [Import] to select.**